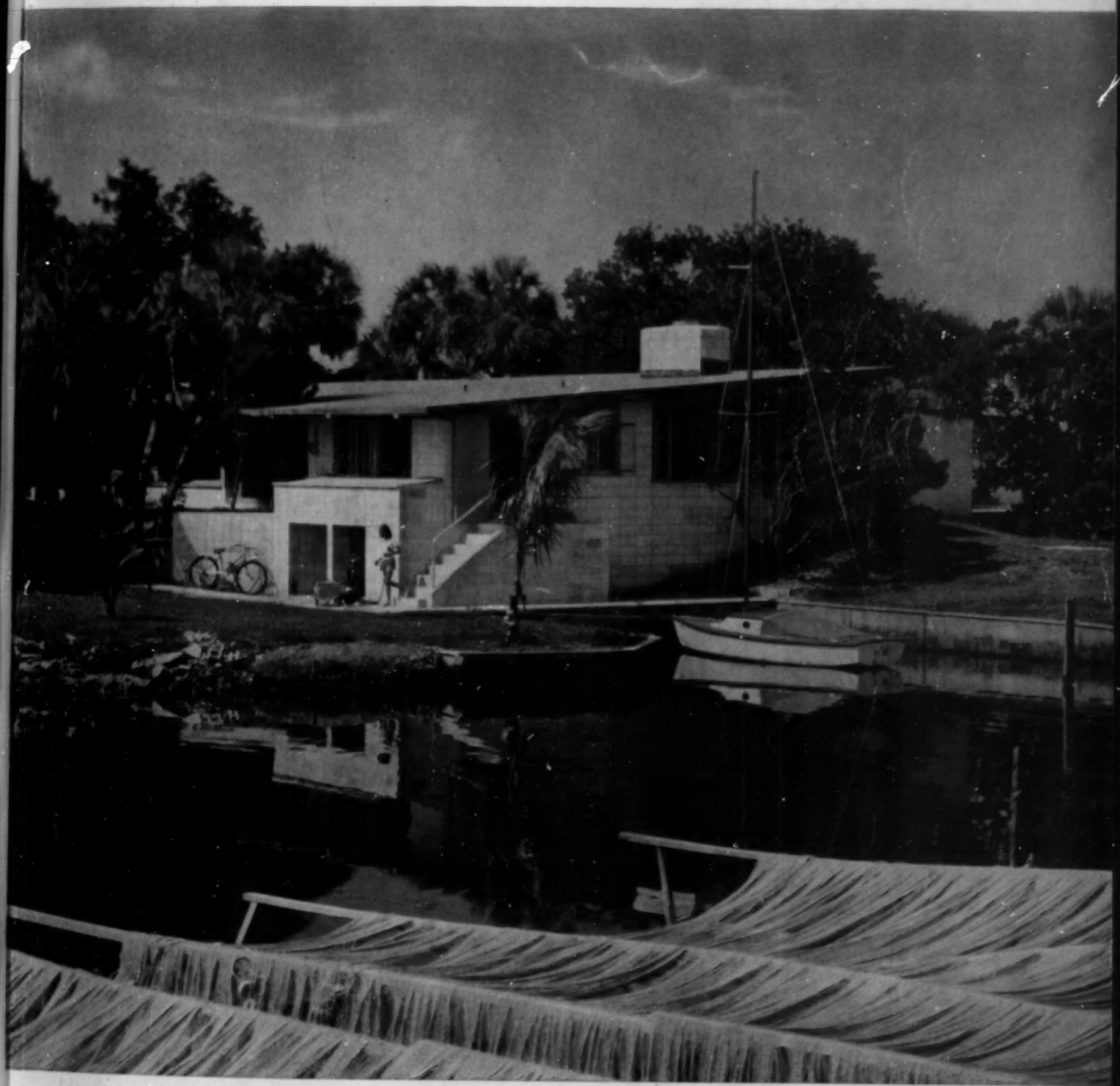
chitectural
Library

JAN 16 1950

JANUARY 1950

ARCHITECTURAL RECORD



Just wait 'til

You get a Peek

at the 1950 line of Flintkote

Interior Insulation Board Products...

Smart New Colors!

Attractive New Textures!

New, Improved Finishes!

Don't let another day go by. Get the full story *now* on this sensational, new 1950 line of Flintkote Insulation Board Products.

Never before has there been such variety. Now, in this popular, versatile material, you can offer clients their choice from an unusually wide range of colors and finishes.

Write today, THE FLINTKOTE COMPANY, Building Materials Division, 30 Rockefeller Plaza, New York 20, N. Y.

Flintkote has these other leaders, too

INSULATED SIDINGS
ASBESTOS-CEMENT SIDINGS
ASPHALT STRIP SHINGLES
INSULATING WOOL...*made of Fiberglas**

*TM REG. U. S. PAT. OFF. MFD. BY OWENS-CORNING FIBERGLAS CORP.

FLINTKOTE ... *the extra years of service cost no more!*

ARCHITECTURAL RECORD (Regular Edition) (Vol. 107, No. 1, January, 1950) is published monthly by F. W. Dodge Corp., 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $4.50 per year; Foreign, $6.50.

Entered as second-class matter at the Post Office, Concord, N. H., March 16, 1946, under the Act of March 3, 1879.

Vol. 107 · No. 1 *January 1950*

ARCHITECTURAL RECORD

Copyright 1950 by F. W. DODGE CORPORATION, with all rights reserved • Publishing Director, Magazine Division, H. Judd Payne • **EDITORS:** Editor-in-Chief: Harold D. Hauf, A.I.A., A.S.C.E.; Managing Editor, Emerson Goble; Associate Editors, Robert E. Fischer, Frank G. Lopez, A.I.A., Florence A. van Wyck; Washington News, Ernest Mickel; Contributing Editor, Frederic A. Pawley; Western Editor, Elisabeth Kendall Thompson; Special Editorial Representative, Western Section, William C. Rodd; Associate in South America, Edmund J. Whiting, A.I.A.; Editorial Assistant, Jeanne Davern • **ART DEPARTMENT:** Myron S. Hall, 3rd, Director; Frances Torbert, Assistant; Sigman-Ward, Drafting • **CONSULTANTS:** Chairman, Editorial Board, Kenneth Kingsley Stowell, A.I.A.; Industry Relations Consultant, Thomas S. Holden; Statistical Consultant; Clyde Shute; Building Economics Consultant, Norbert Brown; Field Research Consultant Clifford Dunnells, Jr.

Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 10 Ferry St., Concord, N. H., with Editorial and Executive Offices at 119 West 40th Street, New York, N. Y. Western Editorial Office, 2813 Channing Way, Berkeley, Calif. Thomas S. Holden, Pres.; Howard J. Barringer, Vice-Pres. and Treas.; Irving W. Hadsell, Vice-Pres.; Chauncy L. Williams, Vice-Pres.; Sanford D. Stockton, Jr., Secy.; Walter F. De Saix, Asst. Treas.; Edwin H. Freed, Asst. Treas. Member Audit Bureau of Circulation and Associated Business Papers, Inc. Architectural Record is indexed in Reader's Guide, Art Index, Industrial Arts Index and Engineering Index. Subscription rates: United States and Possessions, Canada, Cuba, Mexico, Central and South America, and Spain, $4.50 the year, $7.50 for two years, $9 for three years; elsewhere, $6.50 the year, $11.50 for two years, $15 for three years. Single copy $1. Circulation Manager: Marshall T. Ginn. Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage. Other Dodge Services: Real Estate Record & Builders' Guide, Sweet's Files, Home Owners' Catalogs, Dodge Reports & Dodge Statistical Research Service.

COVER:

Russell House, Sarasota, Fla. Ralph S. Twitchell and Paul M. Rudolph, Architects. Color photograph by Joseph Janney Steinmetz

THE RECORD REPORTS 9
- News from the Field 9
- News from Washington. By Ernest Mickel 15
- Construction Cost Indexes 26
- Required Reading 28
- News from Canada. By John Caulfield Smith 136

SPACE AND PEOPLE 69
By Garrett Eckbo. Condensation of part of a new ARCHITECTURAL RECORD book, *Landscape for Living*, scheduled for publication early in 1950

FOR JOYOUS LIVING AND FIVE CHILDREN 76
Residence for Mr. and Mrs. Maynard E. Russell, Sarasota, Fla. Ralph S. Twitchell and Paul M. Rudolph, Architects

DESIGNED FOR VACATIONS 85
Hunting Lodge and Summer Cottage for Mrs. William P. Palmer, Jr., Blue Hill, Maine. Louis Gelders, Architect

PLANNED FOR RESEARCH 88
Laboratories and Offices for the National Research Corp., Cambridge, Mass. Perry, Shaw and Hepburn, Architects

BUILDING TYPES STUDY NO. 157
SMALL BUSINESS BUILDINGS *By Frederic Arden Pawley, Architect*
- Introduction 94
- Finance and Real Estate Viewpoint 96
- Location Factors: Decentralization, Zoning, Parking 103
- Planning 106
- Features, Equipment, Materials 110
- Fire Insurance 110

ARCHITECTURAL ENGINEERING
Technical News and Research

AIR CONDITIONING WORKS WITH DESIGN 112
For Space Utilization, Flexibility, Economy. George L. Dahl, Architects and Engineers

PREVENTING CONDENSATION IN DWELLINGS . . . 115

MOUNTAIN INN BUILT WITH PLASTICS 119

TIME-SAVER STANDARDS . . . Heating Systems for Houses 120
Part IV: Cast Iron Baseboard Heating Systems. By William J. McGuinness

PRODUCTS . . . for Better Building 124

MANUFACTURERS' LITERATURE 132

NOW AVAILABLE

FREE TO EVERY ARCHITECT

American-Olean "Color Book of Tile"

The most complete, most helpful tile book ever produced. One hundred pages, including thirty full color pages of typical installations, plus color charts of wall and floor tile, trim and hand decorated inserts. Full architectural data and ready-to-use specifications.

YOUR COPY WILL BE MAILED TO YOU SOON
BE ON THE LOOKOUT FOR IT

Arch. Wash

THE RECORD REPORTS

ARCHITECTS GATHER FOR A.I.A. REGIONAL CONFERENCES

New England Hospital Seminar and two St. Louis meetings highlight increased Institute activity at chapter and regional level

New England Seminar on Hospitals

In Boston, about 125 architects who design hospitals and an equal number of hospital administrators, trustees and doctors discussed common problems from their different viewpoints in four sessions Dec. 2 and 3.

The Hospital Seminar, first regional meeting ever held by the six New England Chapters, was occasioned by current interest in hospital planning, and received a not-unexpected fillip from the new Hill-Burton Act, under which Congress has just doubled the amount of Federal funds for hospital construction.

The Seminar also was the first opportunity for open discussion of relations between architects and hospital consultants. Slocum Kingsbury, for the A.I.A., and Dr. Allen Craig, for the newly organized American Association of Hospital Consultants, exposed early liaison efforts of the two groups and traced out the two lines of responsibility in planning hospitals.

Basil C. MacLean, M.D., director of Strong Memorial Hospital, University of Rochester, was moderator at the first morning's session, when speakers were Henry N. Pratt, M.D.; William A. Riley, A.I.A.; Slocum Kingsbury, A.I.A.; Allan Craig, M.D.; Marshall Shaffer, A.I.A. Otis Anderson, M.D., addressed the luncheon meeting. At the afternoon session, with Douglas Orr, A.I.A., as moderator, the conference heard Herman Smith, M.D.; Alice C. MacKinnon; Victor A. Frid, A.I.A.; James H. Ritchie, A.I.A. Albert Snoke, M.D., was the dinner speaker.

In the absence of Walter I. Taylor, A.I.A. education and research director, Harold D. Hauf was moderator at the Saturday morning session, which featured Justin M. Kearney, C.E.; Lester E. Richwagen; Carl Walter, M.D.; Robert W. Cutler, A.I.A.; Roy Hudenburg. At the luncheon round table on "Hospitals of the Future," speakers were: A. Daniel Rubenstein, M.D.; Henry R. Shepley, A.I.A.; Arthur G. Stephenson, F.R.I.B.A. (Melbourne, Australia); Isadore Rosenfeld; Nathaniel W. Faxon, M.D.; Robert Cutler.

Educational and Regional Meetings at St. Louis

There were two meetings in St. Louis. The first was an educational meeting on Thursday, November 17, held at Washington University. This was attended by representatives from all architectural schools in the Central States District. The morning session was devoted to discussion of the architectural design program as an instrument of architectural education. In the afternoon, Alfred Roth presented a paper on "In Search of a Theory of the New Architecture." Mr. Roth, prominent architect and author from Switzerland, is visiting professor of architecture at Washington University.

The second day's meeting, at St. Louis' Sheraton Hotel, was opened by Lorentz Schmidt, Director of the A.I.A. Central States District. Speakers included Philip Will, Jr., pinch hitting for Ernest Kump on the subject of school design. James M. Fitch, Jr., spoke on "Residences: Control of the Elements through Planting and Structure." Nathaniel A. Owings discussed design of large buildings and groups of buildings.

At the dinner that evening Ralph Walker, national president of the A.I.A., spoke on the necessity of integrating architectural education and practice. At the Saturday morning session on November 19, Kenneth Welch presented the subject of "Design of Stores, Planning and Lighting"; and Edmund Purves, executive director of the A.I.A., spoke on "The Institute, Legislation and You."

Photos: top, Charles McCormick; center, Peter Ferman

Pictured at conferences described on this page: (top, at Boston) Kenneth Reid, executive committee chairman; Dr. Basil C. MacLean; Charles D. Maginnis, F.A.I.A., general chairman; Charles D. Maginnis, Jr.; (center, at St. Louis) Alfred Roth, Swiss architect; Kenneth Wischmeyer, A.I.A. 2nd vice president; Lorentz Schmidt, A.I.A. regional director; Ralph Walker, A.I.A. president; (pointing) St. Louis A.I.A. Chapter President Arthur Kelly; above, again St. Louis, Dean Joseph Murphy with Mr. Roth

"BEST LOW COST HOUSING" IN MASSACHUSETTS

Hampshire Heights Housing Project
Northampton, Massachusetts

Apartments were built at an amazingly low cost per unit. They are self contained, with individual equipment. Each has great privacy and views of gardens and mountains

James A. Britton, Architect ***Jo Ray, Site Planner***

The Northampton Housing Authority, developer of this pleasant low-rent Veterans Housing Project now being completed, requested the architect to provide buildings modern in design and use materials requiring little upkeep. Units were to take advantage of views of two neighboring mountain ranges and have living rooms open on gardens.

The project comprises 17 four-apartment buildings and two six-apartment buildings, irregularly placed to avoid regimentation and give privacy. Buildings cover only 10.63 per cent of the sloping 9.61 acre tract, leaving space for gardens, inclosed laundry yards and 100 per cent off-street parking.

Apartment units cost $10,725.00 each, with basement and two floors in a row-house type of arrangement. On the first floor each unit has an entry, kitchen, living room and dining alcove. Either two or three bedrooms and a bath are on the second floor. Exteriors are of brick veneer and western cedar, and interiors have hard plaster walls and asphalt tile floors. Equipment provided includes individual forced warm air heating plants, hot water heaters, electric ranges, incinerators and laundry facilities.

The Massachusetts State Housing Board and other housers and planners have cited this project as the best example of low cost housing and site planning in the state

QUALITY HOUSES SPECULATIVELY BUILT IN SALT LAKE CITY

Integrated indoor-outdoor living areas add space to compact houses. The frank, simple units are designed for repetition

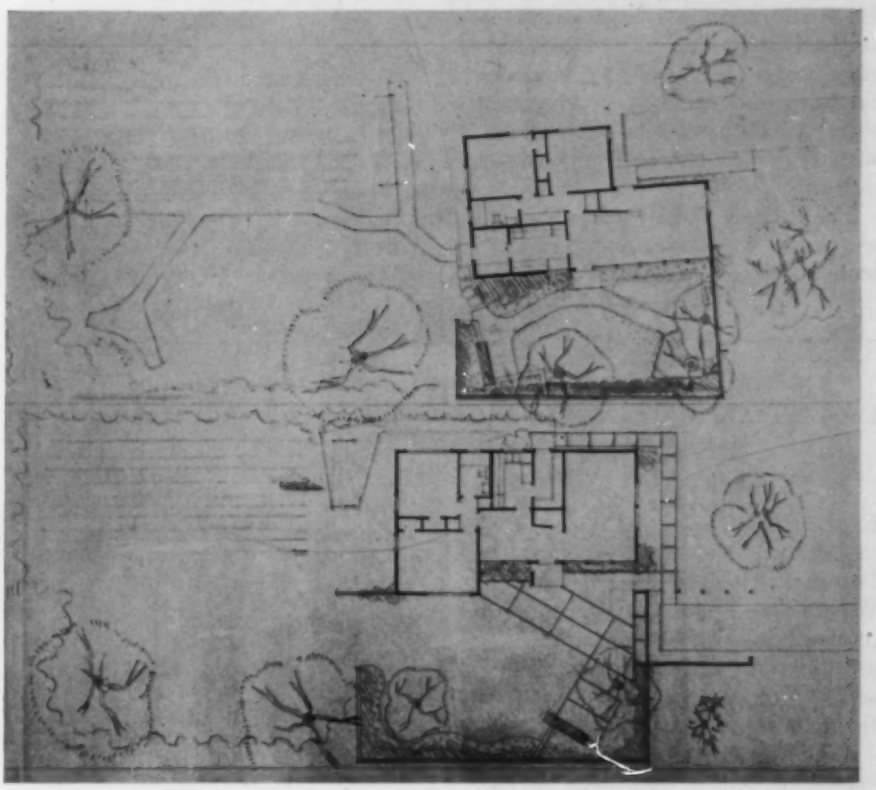
Joern Gerdts Photo

Fred Markham, Architect
W. Rowe Smith, Designer

These forthright, well designed houses are part of the nation-wide program of the Revere Quality House Division, Southwest Research Institute, to promote better residential building. The houses were exhibited to show quality of construction and design obtained in moderate priced structures by close architect-builder teamwork.

The problem set was the design of a salable unit which could be repeated to produce a harmonious grouping, flexible enough to retain individuality. A balance was struck between low first cost and low maintenance expense. All construction difficulties were carefully studied to help formulate new standards.

Two basic schemes were evolved, as shown here in plan and photograph. Plans were designed to give a sense of openness, yet maintain good circulation and privacy. South walls are mostly glass and face enclosed outdoor living areas. To further the sense of space, ceiling lines were sloped with the roof, the vertical redwood siding was used on some interior walls, and windows run to the ceiling where possible. The developer states he would build more of the frame houses on any lot in Salt Lake City for about $12,000, including landscaping, electric dishwasher, disposer, heating, washer, and carpets in living and dining rooms.



INDUSTRIAL ADMINISTRATION SCHOOL AT CARNEGIE

Architects Marlier (right) and Johnstone of Pittsburgh discuss their model for building

Ground will be broken next spring for the nation's first graduate school of industrial administration on the Carnegie Institute of Technology campus, Dr. Robert E. Doherty, Carnegie's president, has announced. Architects for the building are Raymond M. Marlier and B. Kenneth Johnstone of Pittsburgh. Mr. Johnstone is head of the Department of Architecture at Carnegie.

The million-dollar building, financed under a six-million-dollar gift to Carnegie for foundation of the school by the W. L. and May T. Mellon Foundation, will include, besides offices and classrooms, a 6000-volume library, a lecture hall to hold 150 students, laboratories, and a student lounge for informal discussion groups and relaxation.

Opened on an experimental basis this year, the school will begin full-scale operation next September.

THE RECORD REPORTS

$4000 HOUSE DESIGN OFFERED TO RAISE LOW-COST STANDARDS

The Design Office of

J. Bennett Smith, Designer

Garber-Sturges Photo

Three rooms plus bath and entry and a one-car garage were achieved for $4000 in this California house built under wartime restrictions in 1945.

With overall floor space of 624 sq ft, the house, which was recently sold for $9500 with an $8500 FHA guarantee, contains living-dining room with fireplace and storage wall; kitchen with breakfast space and laundry area; bedroom with 10-ft wardrobe including mirror and drawer; and bath with shower over tub.

The designer frankly offers this job as a challenge to such current "low-cost" housing projects as Housing Expediter Tighe E. Woods' Housing, Inc., which plans to market two-room houses 14 by 36 ft with half-acre plots for about $6750 in a 42-acre development near Fort Belvoir, Va. (See ARCHITECTURAL RECORD, September 1949, page 10.)

"This dwelling," Mr. Bennett says of the house designed by his office, "gave the client more than a makeshift kind of living." The Housing, Inc., plan, Mr. Bennett writes, "leaves so much to be desired I believe a trailer would offer more. The people of America want homes, not housing."

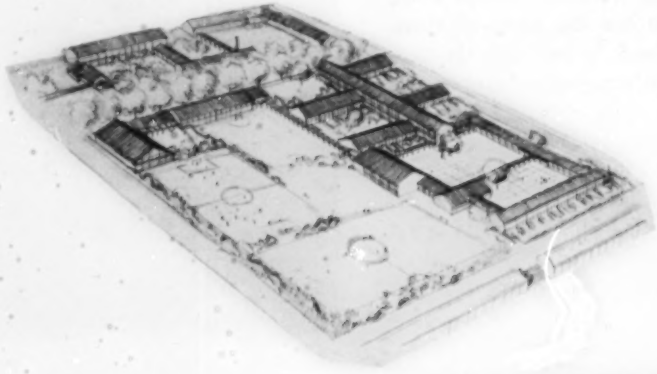
DANISH ARCHITECT HERE TO STUDY U. S. SCHOOLS

Eric Stengade, 35-year-old Danish architect who was in charge of designing the Danish exhibition hall for the New York World's Fair, is in this country to study contemporary school buildings before undertaking a commission to design a permanent home for the new Bernadotte International School in Copenhagen.

The school, which was officially opened last August with some 240 students from many countries, now occupies an old building (decorated by the children themselves) which is far from adequate. Parents of the children, who range in age from 4 to 11, are raising money for the new building, with a promise from the Danish government to match any sum they can raise, although the school is independent of the state system.

Mr. Stengade's recent work includes the three-room house (photos at right) which was built two years ago for the equivalent of $1200.

A former assistant to Tyge Hvass, leading Danish architect, Mr. Stengade was recently awarded the Gold Medal of the Royal Academy of Fine Arts in Copenhagen for his design of a newspaper plant.



Rendering (above right) shows architect's preliminary drawing for projected building for Bernadotte School. Photos (right and below) show exterior and interior views of house built at cost of $1200

WASHINGTON NEWS *by Ernest Mickel*

HIGH on the federal government's list for priority planning are the more than 500 post office and other federal building projects authorized by a new act of Congress in 1949.

Just a month ago the General Services Administration and the Post Office Department made a selection of 313 federal building projects for which sites will be acquired where needed and for which plans and specifications will be prepared for future construction.

This action sets in motion the plan to resume construction of buildings of this type after a virtual lapse for the past 14 years.

The bill passed during the last session of Congress (now Public Law 105) authorized $40 million for site acquisition and the preparation of plans and specifications for approximately 575 projects estimated to cost $377 million when completed. Later the Congress made $12 million of this $40 million available. Public Buildings Administration, a GSA constituent agency, now is

(*Continued on page 16*)

"I hope you noticed, while you were here, the brilliant way in which the architect made the guest room a buffer between the children's room and the living areas—"

— Drawn for the RECORD *by Alan Dunn*

TRANSFIGURATION SCHOOL, Tarrytown, New York *Robert A. Green, Architect*

Among the most widely visited schools built in this area within recent years, this school for a Carmelite parish was the outcome of an intensive postwar investigation by the Archdiocese of New York of low-cost construction in the school field. Built at a cost of 84 cents per cu ft, it was developed as a prototype for the projected school building program of the Archdiocese.

Center of interest on the school's north side is sheltered main entrance (below)

Photo by James Vincent

Before Archdiocesan officials brought the problem to Mr. Green for his solution, they had canvassed the possibilities of the prefabrication field, and of other current types of "low-cost" construction, and had come to the conclusion that, as they express it, use of "standard methods of construction, simplified, was the direct answer."

As finally evolved, the plans called for a one-story structure of native stone, backed by hollow textured concrete blocks, with interior face exposed to become classroom wall surface, unplastered and unpainted. Corridor walls were built of the same blocks, with glass block "borrowed lights."

Each room has a large projected-type window, with upper and lower sections movable and center section fixed to give the appearance of a picture window. Lighting fixtures for all classrooms are of the concentric ring incandescent type, an inexpensive fixture with maximum lumen output and minimum maintenance.

Expenditure of $282,261 completed a school containing eight classrooms, for 350 children; a kindergarten; a combination meetingroom-lunchroom for 75; administrative offices; an auditorium-gymnasium seating 500 and fully equipped for both its functions. The figure covered cost of equipment, including the radiant heating installation, furnishings and draperies.

Opened for classes this Fall, the school has been described by the parish Fathers as "a proper jewel to crown 50 years of growth in the Parish of the Transfiguration in Tarrytown."

THE
H & H
WIRING DEVICE
Line
HAS EVERYTHING
FOR RESIDENTIAL WIRING
FOR INDUSTRIAL WIRING
The wiring devices shown above represent just a few of the hundreds in our complete line. And it's your line! In it, you have everything you need to meet the most complex specifications — quickly and easily. More than 35 different classifications of wiring devices to choose from! In all, more than 1800 individual, cataloged units— everything you need for the ultimate in convenience, utility and dependability.
See our listing in Sweet's Architectural File.
Branch Offices: Boston, Chicago, Dallas, Denver, Detroit, Los Angeles, New York, Philadelphia, San Francisco, Syracuse
In Canada: Arrow-Hart & Hegeman (Canada) Ltd., Mt. Dennis, Toronto
For more information, write today to: 1901 Laurel Street Hartford 6, Conn.
ARCHITECTS WHO KNOW BEST SPECIFY
HART H & H HEGEMAN DIVISION
WIRING DEVICES
ENCLOSED SWITCHES
THE ARROW-HART & HEGEMAN ELECTRIC COMPANY
HARTFORD, CONNECTICUT

THE RECORD REPORTS

WASHINGTON

(*Continued from page 15*)

launching the planning and site program with this initial appropriation.

The remaining selections from an original listing of some 4000 eligible projects will be announced by PBA and the Post Office Department in a few weeks.

The law as now in operation provides no construction funds for any of these buildings. Appropriations for the start of the site work would have to come in new legislation after the funds were authorized. But until this construction does start, sometime in the next few years, a portion of the planning activity will be assigned by PHA to private architects.

In announcing the first selection of projects, GSA said it was the expressed intent of Congress that each Congressional district participate "in the benefits that will accrue from the future construction of one or more of the selected programs."

Planning for Non-Federal Projects

Architects have as vital an interest in another GSA program moving forward, the advance planning of non-federal public works.

A little over a month ago GSA Administrator Jess Larson announced allotment of the initial $25 million to states and possessions — the first portion of a $100 million outlay authorized by Congress last year to reactivate the Bureau's loans.

In practice, the advance loaning program works this way: states, counties, cities and towns borrow a sum from the Bureau to cover the cost of preparing plans and specifications on non-federal public works such as schools, hospitals, sewers, waterworks, streets, municipal buildings and like projects. The loans are interest-free and repayment to the U. S. Treasury begins whenever construction starts.

Architects and Housing

The nation's private architects were in the throes of argument with public housing personnel over what constitutes an adequate fee schedule, fair payment for services rendered on public housing projects.

(*Continued on page 18*)

R. H. WHITE'S
in its beautiful remodeled store
has installed the new
Vinatred® vinyl carpeting

R. H. WHITE'S
WASHINGTON AT BEDFORD STREET
BOSTON 12

November 18, 1949

EXECUTIVE OFFICES

Mr. Martin A. North
Director of Merchandising
Southbridge Plastics, Inc.
470 Fourth Avenue
New York 16, N. Y.

Dear Mr. North:

Thank you for your letter stating that R. H. White's is one of the principal stores using Vinatred.

We have six departments now covered with Vinatred, and it not only improves the appearance of the store, but has been received with pleasure by our customers and sales force.

We are pleased with its performance and attractiveness.

Yours sincerely,

R. H. WHITE'S

John B. Knox
President

JBK:mg

IN THE MEN'S SHOP, Vinatred provides a business-like impersonal character plus long-time durability.

IN THE TODDLER SHOP, Vinatred keeps the floor clinically clean and safe for young footsteps.

IN THE CHINA SHOP, Vinatred creates a colorful setting that is quiet, too, under customer traffic.

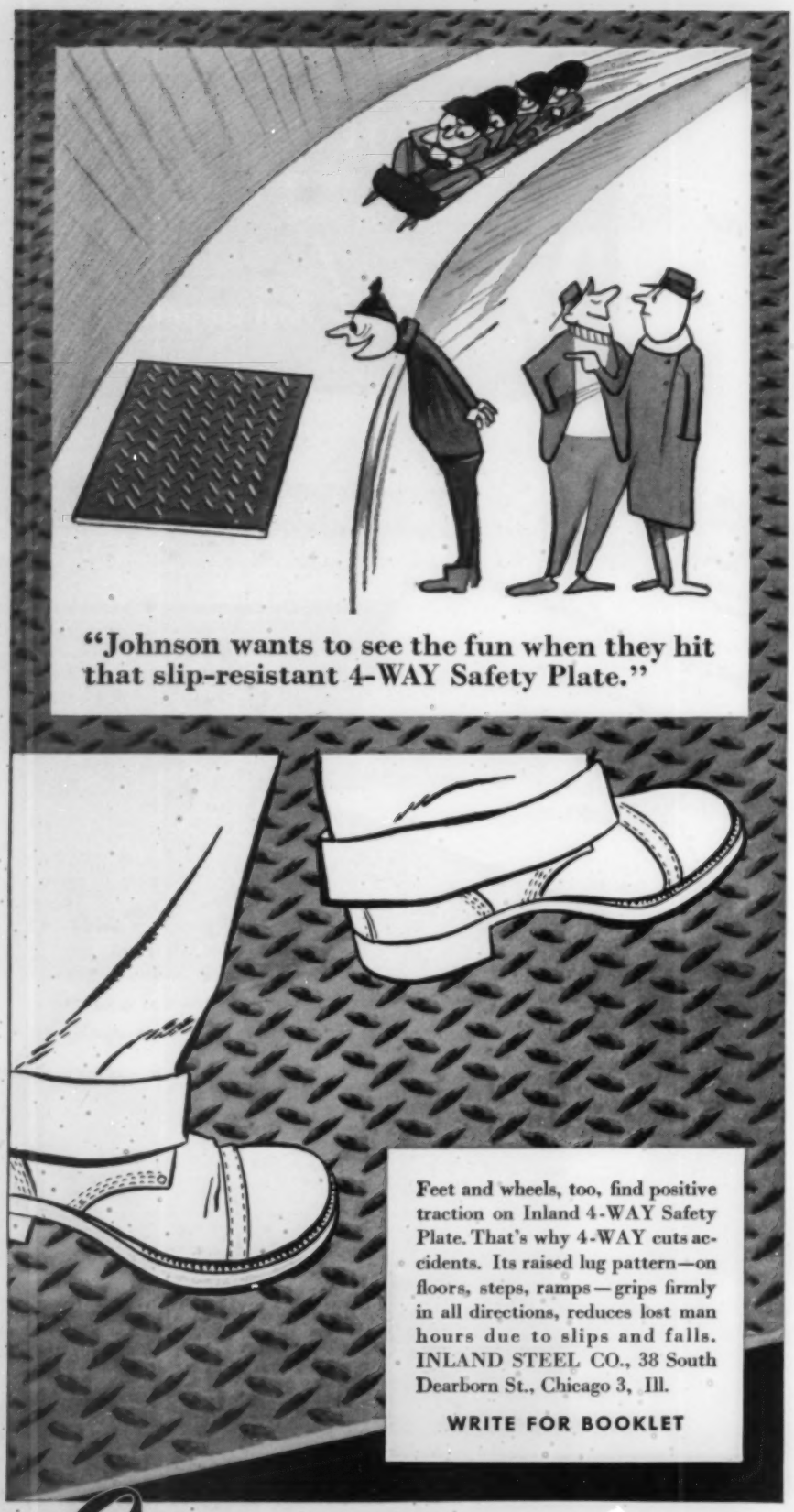
Vinatred is a clear vinyl carpeting with embossed surface, fabric-backed. It comes in 8 decorator colors, and prints.

Results of rigid tests by the United States Testing Co. prove that Vinatred has a non-porous, cleanable, sanitary surface; superior wear resistance; skid-resistance; resilience when laid as recommended with Vinatred cushion.

Write for the name of the distributor in your vicinity.

Southbridge Plastics INC.

470 FOURTH AVENUE · NEW YORK 16, NEW YORK


"Johnson wants to see the fun when they hit that slip-resistant 4-WAY Safety Plate."
Feet and wheels, too, find positive traction on Inland 4-WAY Safety Plate. That's why 4-WAY cuts accidents. Its raised lug pattern—on floors, steps, ramps—grips firmly in all directions, reduces lost man hours due to slips and falls. INLAND STEEL CO., 38 South Dearborn St., Chicago 3, Ill.
WRITE FOR BOOKLET
Inland
4-WAY SAFETY PLATE
STOCKED BY LEADING STEEL WAREHOUSES
Reg. U. S. Pat. Off.

THE RECORD REPORTS

WASHINGTON

(*Continued from page 16*)

A.I.A. President Ralph Walker told delegates to the 16th annual convention of the National Association of Housing Officials in Boston that he considered the present fee schedule on PHA projects woefully inadequate. The Institute has advised its members that they accept the fees "at your own risk."

PHA has contended that private architects have been receiving more than six times the amount of their payroll expense on public housing projects, while Mr. Walker has told the public housers: "You are not dealing with a capitalist class. The net take-home pay of three-fourths of the country's architects is $5000 or less a year."

Operating procedures for the vast slum clearance and urban redevelopment phase are being promulgated now and will be issued to local authorities soon. Here again, architectural and engineering services will be of vital concern to those charged with clearing sites and projecting new developments. Congress authorizes the government to pay up to two-thirds of the net write-off of clearing these slum areas and has provided $1 billion in loans to help cities clear and prepare slum sites for redevelopment.

Shorts

• Atomic Energy Commission stepped up the pace of its huge construction program. At Oak Ridge, Tenn., with building well started on Unit K-29, AEC said the contractor, Maxon Construction Co., Inc., Dayton, Ohio, had been approved as construction contractor for a fourth gaseous diffusion unit, K-31, costing about $162 million. Giffels and Vallet, Inc., L. Rosetti, Detroit, Mich., having designed the $66 million K-29 project, also have been approved as architect-engineer for K-31.

• First research correlation conference of the new Building Research Advisory Board will be held in Washington, D. C., January 11 and 12. Under the title "Weather and the Building Industry," this conference will consider climatological research and its effects on building design, construction, materials and equipment. Exhibits of new climate research results will be shown. This meeting will be conducted informally.

(*News continued on page 20*)

Build Smokeless FIREPLACES without costly supervision!

Compact Heatilator Unit insures correct construction*

With the growing shortage of skilled masons, are you spending too much time supervising fireplace construction?

Use a Heatilator Fireplace Unit, and insure a fireplace that draws properly and will not smoke.

The Heatilator Unit is a complete fireplace from hearth to flue, around which the decorative masonry is built. It consists of:

1. *A scientifically designed firebox*
2. *A properly proportioned throat to insure proper draft*
3. *A removable damper with adjustable poker control*
4. *Extra wide down-draft shelf made of heavy steel*
5. *Complete metal smoke dome to speed passage of smoke into chimney*

By providing these parts in one compact form, with no extra parts to buy or build, the Heatilator Unit permits unsupervised construction. It eliminates guesswork and other causes of failure.

Costs little, if any, more than ordinary fireplace

Because the Heatilator Unit is ready to install, it saves mason time and labor. It saves on expensive firebrick. *Thus, a completed Heatilator Fireplace costs little, if any, more than an ordinary fireplace!* In addition to this original economy, your client can count the dollars-and-cents savings of smokeless, trouble-free operation.

Heatilator Unit ups fireplace efficiency

The Heatilator Fireplace draws in cool air from floor level, heats it, and circulates it to every corner of the room, and to other rooms as well. On cool Spring and Fall days, this use of heat ordinarily wasted makes furnace operation unnecessary. In mild climates, it is the only heating equipment needed. It saves the cost of expensive heating plants that are used only a short time each year.

Heatilator Fireplaces are ideal for summer camps and cabins, making them usable weeks longer in Spring and Autumn. It solves the heating problem in basement recreation rooms without unsightly pipes and radiators. Heatilator Units, made of boiler plate steel, are built for a lifetime.

A Heatilator Fireplace permits any architectural style and the use of any material. The air intake and outlet grilles are easily placed to blend with the general design. When the mantel projects, the grilles are out of sight. If the mantel is flush, the intakes can be placed in baseboards on either side of the hearth . . . outlets high above mantel, in ceiling, or in an upstairs or adjacent room.

Give clients the advantages of a Heatilator Unit.

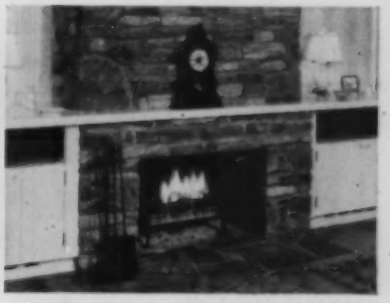
**Heatilator is the reg. trademark of Heatilator, Inc.*

HEATILATOR UNITS ADAPT THEMSELVES TO ANY DESIGN

A Colonial Fireplace built around a Heatilator Unit. Warm-air grilles are located in the bookshelf sides.

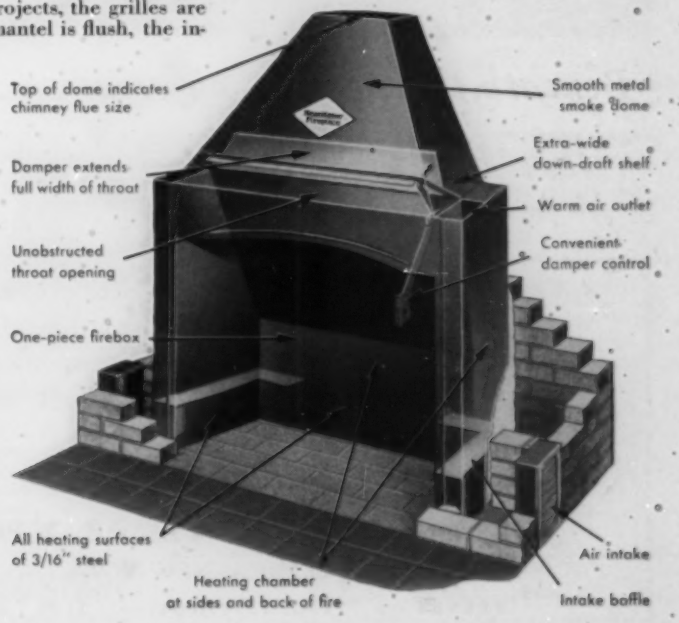
Classic design, with the modern advantages of a Heatilator Fireplace Unit. Grilles are located at sides.

A Heatilator Fireplace is the only heating equipment needed for many Florida homes, like this one.



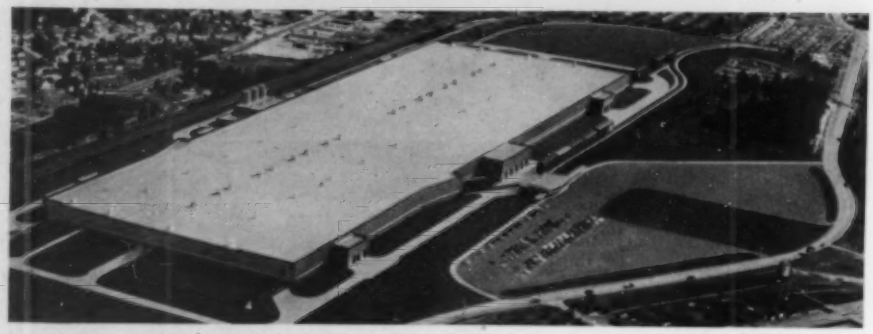
The grilles in this Northern fieldstone fireplace are hard to find. An example of ingenious design.

Write today for complete information and illustrations showing the variety of architectural styles possible with Heatilator Fireplace Units. Heatilator, Inc., 611 E. Brighton Avenue, Syracuse 5, N. Y.


Top of dome indicates chimney flue size
Damper extends full width of throat
Unobstructed throat opening
One-piece firebox
All heating surfaces of 3/16" steel
Heating chamber at sides and back of fire
Smooth metal smoke dome
Extra-wide down-draft shelf
Warm air outlet
Convenient damper control
Air intake
Intake baffle

HEATILATOR
T.M. REG. U.S. PAT. OFF.
America's Leading
FIREPLACE

 (*Continued from page 18*)



NEW PLANT FOR LINCOLN ELECTRIC COMPANY

The Austin Company, Engineers and Builders

With a basic floor plan and functional layout which are expected to reduce cost of materials handling to a minimum, this Euclid, Ohio plant for manufacturing welding equipment (model photo at left) is essentially a one-story structure, 1400 by 500 ft, with a centrally-located 60-ft-wide service floor the full length of the building (east to west) below ground.

The building, to be erected at an approximate cost of $8,500,000 for 850,00 sq ft of floor space, has a framework of shop and field welded structural steel and a flat roof. Aluminum facing sheets, specially rolled to form 3½-in.-deep box sections 15 in. wide and 25 ft deep, are being used for the exterior facing. The inner wall consists of 1¾ in. steel panels of comparable height are welded to framing.

The strength of the lightweight, deep-drawn aluminum facing units makes it possible to span a distance of nearly 20 ft vertically without any intermediate girts. They are being supported entirely by three rows of specially-designed composite aluminum-and-steel stud-welded fasteners.

PRODUCT LITERATURE COMPETITION

Awards to three classes of technical and promotional literature prepared for architects by manufacturers of building products will be made in a competition being sponsored by the Producers' Council and the American Institute of Architects.

All manufacturers of building materials and equipment may submit entries, and architects are also invited to make nominations for the awards. All entries and nominations must be made by Mar. 15, 1950.

Awards in the three classes — technical and design data, data on use and application of products, and promotional literature — will be announced next May.

Manufacturers should submit entries to the Producers' Council, 815 15th St., N. W., Washington, D. C.; architects or A.I.A. chapters should send their nominations to the American Institute of Architects, 1741 New York Avenue, Washington, D. C.

(*Continued on page 22*)

Beneath the Beauty you create . . .

and a part of it, is function. Underlying the function, and contributing to it is the quality and the performance of the equipment and materials you specify. That is why, for assurance of complete reliability and of the utmost dependability you will want to specify KENNEDY Valves. KENNEDY offers a complete line of iron and bronze valves in all sizes and for all purposes, backed by seventy-three years of valve making experience. Write for the complete catalog.

Established 1877

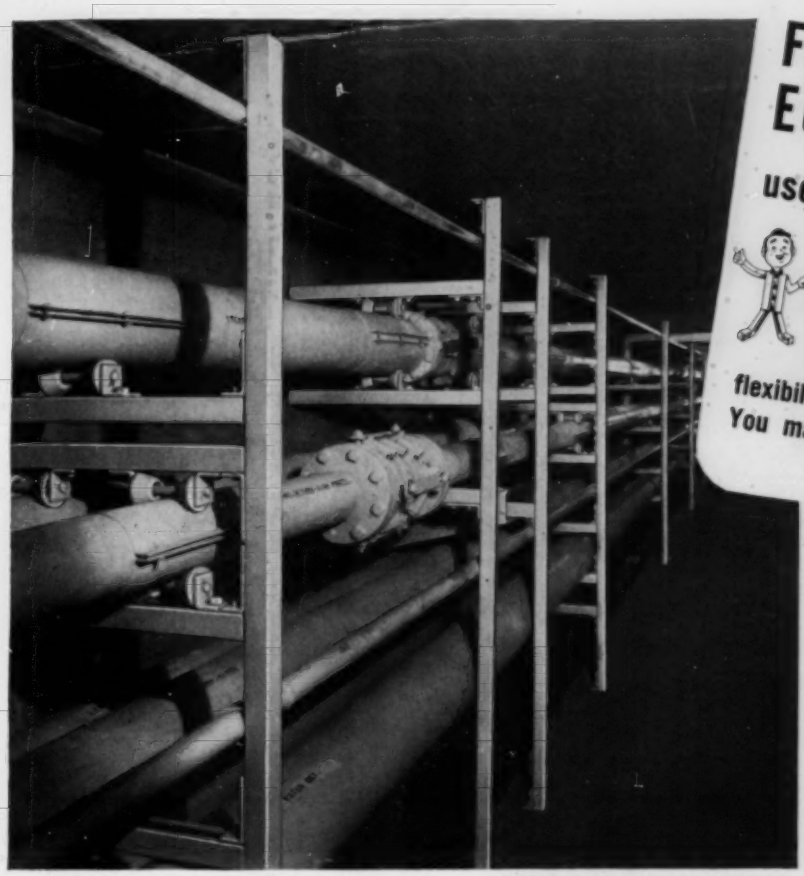
The KENNEDY VALVE MFG. CO.

ELMIRA, NEW YORK

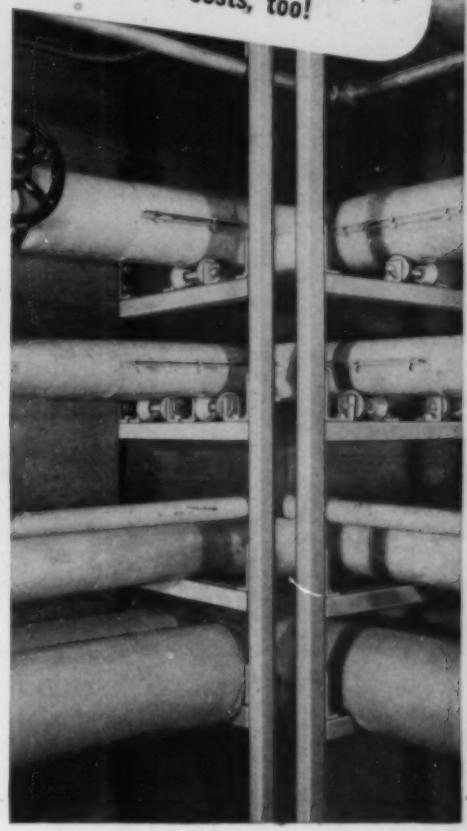
VALVES • PIPE FITTINGS • FIRE HYDRANTS

FOR TUNNEL PIPING and EQUIPMENT SUPPORTS use UNISTRUT METAL FRAMING

Completely adjustable Unistrut provides flexibility you need for right pitch or slope . . . You make adjustments, changes, additions at any time . . . reduce costs, too!



Unistrut steel channel and fittings, roller pipe supports and concrete inserts at work in a tunnel installation at G. D. Searle & Co., Skokie, Illinois, manufacturers of ethical pharmaceuticals.



Unistrut consists of patented metal framing, spring nuts, standard parts and fittings, which in combination provide the world's most flexible method of support or suspension.

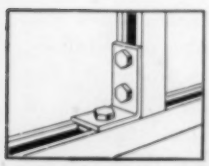
With completely adjustable and reusable Unistrut, normally difficult and complex piping runs may be installed with extreme accuracy, quickly and easily with just a hacksaw and a wrench. No drilling—no welding—no special tools or equipment!

Piping runs can be installed to exactly the right pitch or slope. Adjustments and changes are easily made by the mere loosening of a nut. Additional framing may be added at any time when more piping runs are needed.

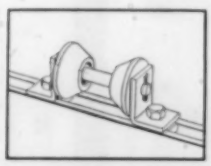
Unistrut is trim framework, providing great strength without bulk. It's easy to work with, lasts indefinitely, and the finished structure assures neat and orderly appearance.

Unistrut cuts costs too. You save time in your engineering department and you eliminate the need for trained erection crews—anyone can build with Unistrut.

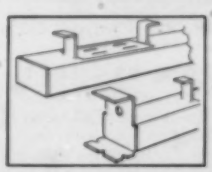
A trial of Unistrut on your next piping job will show you how much quicker, better and more economically the work can be done.



Close-up of patented Unistrut channel members, spring nuts and fittings of a type used in the Searle installation.



Unistrut single axle 2-roller pipe supports as seen in the accompanying photographs. Types available to support from 1" to 36" O.D. pipe.



This Unistrut concrete insert is the type used on the Searle job. 1600 lbs. per foot load capacity. Other sizes and styles available.

WRITE TODAY FOR FREE SAMPLE OF UNISTRUT AND THE FOLLOWING CATALOGS:

Prompt delivery from Warehouse Stocks in Principal Cities. Consult your Classified Directory.

U. S. Patent Numbers
2327587 2329815 2345650
2363382 2380379 2405631
Other patents pending.

The World's Most Flexible All-Purpose Metal Framing

CATALOG 500—
24 pages on how to build frames, hangers and supports for electrical, plumbing, heating and air conditioning equipment—right on the job.

CATALOG 600—
24 pages on how to build racks of all kinds—pallet, bar stock, pipe, tube, conduit, automotive parts, hardware, furniture, floor covering, stock bin racks, and many others.

UNISTRUT PRODUCTS COMPANY
1013 W. Washington Blvd. • Chicago 7, Illinois

UNISTRUT PRODUCTS COMPANY
Dept. R1, 1013 W. Washington Blvd.
Chicago 7, Illinois

Please send sample of Unistrut and catalogs checked below without obligation.

☐ Catalog 500 ☐ Catalog 600

Name_____

Company_____

Address_____

City_____ Zone____ State____

 (*Continued from page 20*)

REMODELLED RESTAURANT

Edmund Lumley, Jr., A.I.A., Architect

Less than five months from the day Orchestra Leader Guy Lombardo gave the go-ahead signal for the alterations and addition to his restaurant at Freeport, L. I., the transformation illustrated by the photographs (left) had been effected.

Lobby, cocktail lounge and bar, with offices above, are in the two-story portion shown in the "before" photograph, with the new flat roof as one of the most striking exterior changes. The dining room and kitchen were entirely rebuilt, using pile foundations, steel frame and plywood exterior and interior.

HOOVER MEDAL AWARD

Dr. Frank B. Jewett, of Short Hills, N. J., former president of the National Academy of Sciences, was awarded the Hoover Medal for 1949, one of the highest honors of the engineering profession, it was announced by Scott Turner, chairman of the Board of Awards, only a short time before Dr. Jewett's death on November 18.

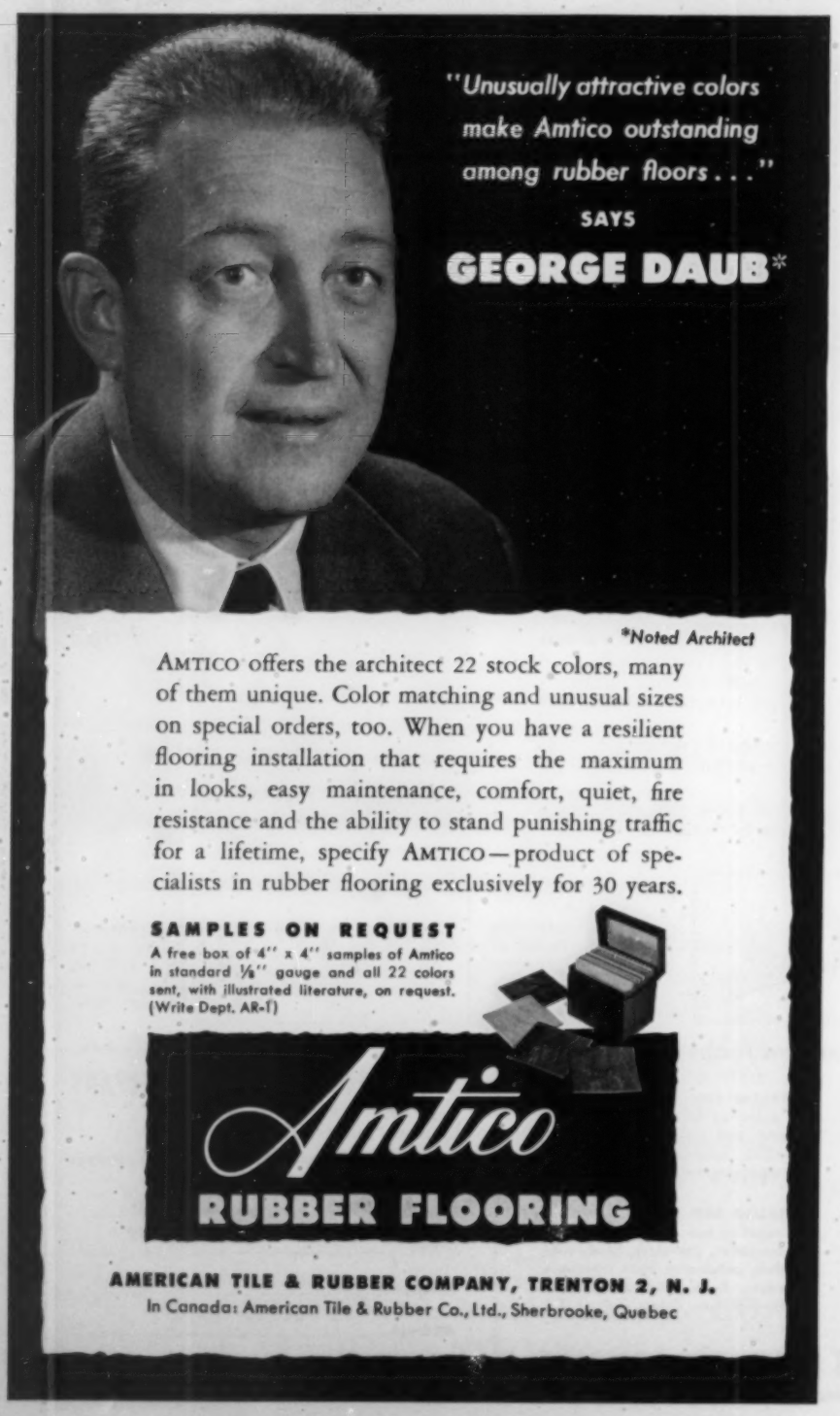
The medal is awarded by the American Society of Chemical Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers and the American Institute of Electrical Engineers.

TWO ARCHITECTS ON CODE COMMISSION

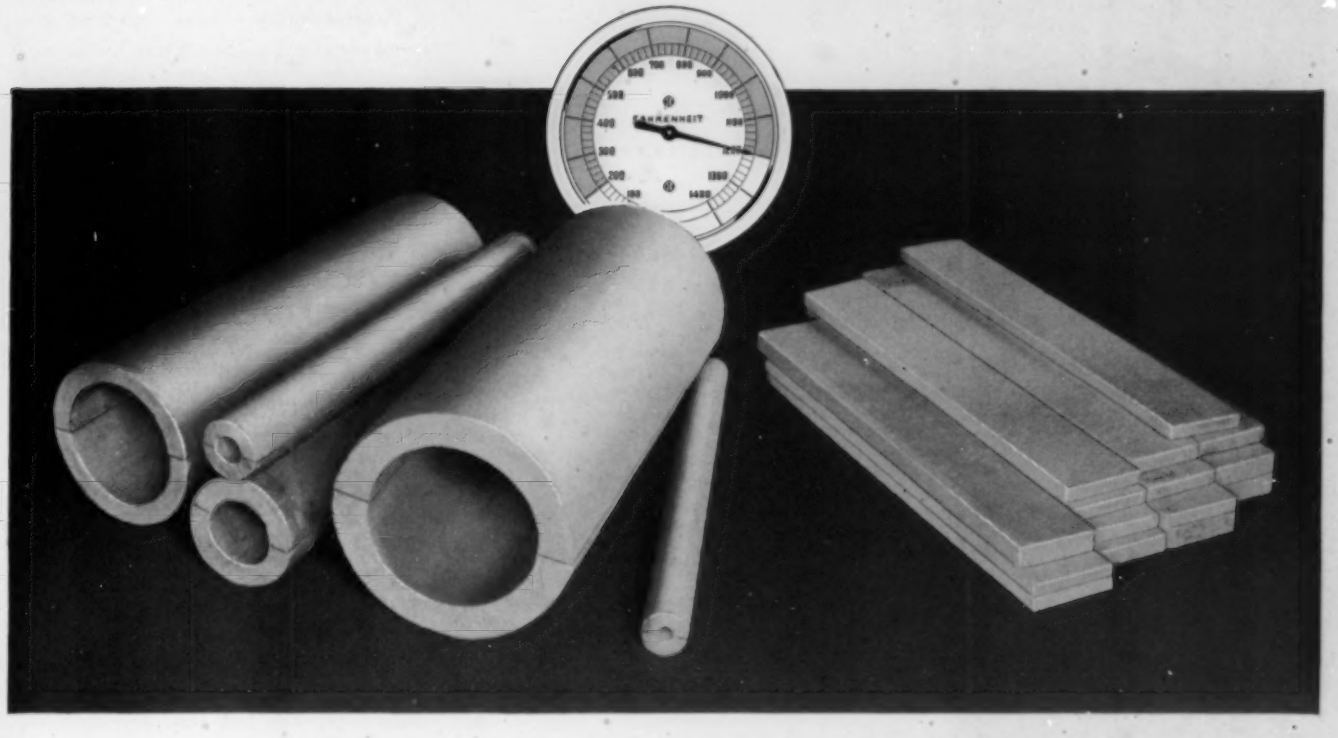
The newly-appointed New York State Building Code Commission, which held its first meeting December 6, in Buffalo, includes two architects among its five members: George Bain Cummings of Binghamton and William Lescaze of New York City. Other members are Edward J. McGrew, Jr., engineer, chairman; Walker S. Lee, of the Rochester Building Commission; and Ralph A. Lehr, lawyer.

The commission was appointed, in accordance with a legislative act passed last spring, to formulate a building code in terms of performance rather than explicit specifications, to encourage modern techniques and lower costs. Use of the code will be left to the discretion of the various municipalities

(*Continued on page 24*)


"Unusually attractive colors make Amtico outstanding among rubber floors . . ."
SAYS
GEORGE DAUB*
*Noted Architect
AMTICO offers the architect 22 stock colors, many of them unique. Color matching and unusual sizes on special orders, too. When you have a resilient flooring installation that requires the maximum in looks, easy maintenance, comfort, quiet, fire resistance and the ability to stand punishing traffic for a lifetime, specify AMTICO—product of specialists in rubber flooring exclusively for 30 years.
SAMPLES ON REQUEST
A free box of 4" x 4" samples of Amtico in standard 1/8" gauge and all 22 colors sent, with illustrated literature, on request. (Write Dept. AR-1)
Amtico
RUBBER FLOORING
AMERICAN TILE & RUBBER COMPANY, TRENTON 2, N. J.
In Canada: American Tile & Rubber Co., Ltd., Sherbrooke, Quebec

ONE MATERIAL INSULATES A 200°F.-1200°F. TEMPERATURE RANGE



KAYLO HEAT INSULATING BLOCK can be easily sawed, cut and scored with standard tools. Cement, canvas or other outer finishes can be applied with minimum effort. Finished jobs have a neat, clean appearance.

KAYLO PIPE INSULATION is produced in Simplified Dimensional Standards of thicknesses and diameters for snug nesting, when necessary. Available in thicknesses from 1 to 3 inches in 36-in. sections for pipe sizes from ½ inch to 12 inches.

Every architect ever confronted with insulation problems should know about Kaylo Heat Insulating Block and Pipe Insulation. No other insulation provides such a combination of advantages.

Available in block or pipe covering form, this material is remarkably efficient throughout a wide 200°-1200°F. temperature range. It is strong and resistant to effects of moisture for long service. It is lightweight, easy to handle and apply.

Many types of industries have found this material ideal for their insulating needs. Get the facts now about Kaylo Heat Insulating Block and Kaylo Pipe Insulation.

KAYLO®

HEAT INSULATING BLOCK and PIPE COVERING

OWENS-ILLINOIS GLASS COMPANY
Kaylo Division Toledo 1, Ohio

SALES OFFICES AT:

Atlanta	Chicago	Minneapolis	St. Louis
Boston	Cincinnati	New York	Toledo
Buffalo	Dallas	Philadelphia	Washington

MAIL COUPON FOR KAYLO INSULATION SAMPLES AND LITERATURE

Owens-Illinois Glass Company
—Kaylo Division Dept. N-18, Toledo 1, Ohio

Gentlemen: Please send me Kaylo heat insulation samples and descriptive literature.

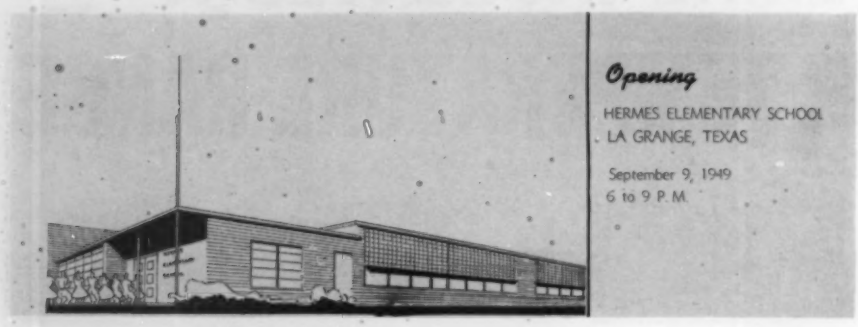
NAME.....

FIRM.....

ADDRESS.....

CITY.....STATE.....

 (*Continued from page 22*)



TAXPAYERS PREVIEW A MODERN SCHOOL

Architect-engineers Page, Southerland & Page of Austin, Texas, report an unusual plan used in the town of La Grange to introduce a new school building of modern design. When the Hermes Elementary School was completed recently, all the taxpayers of the community were invited to "come see" at an open house where parents and teachers played host.

About 60 miles from Austin, La Grange is the center of a farming community of some 10,000 people, including many of foreign extraction. Use of a modern design was the decision of the progressive young superintendent of schools, Charles O. Lemmons. It was believed that the public would support his decision if its advantages could be pointed out to them and the celebration was planned to encourage a large audience.

As a result, some 500 taxpayers came to see how their money had been spent — many of them driving in from miles around. It was felt that the occasion was a real success in encouraging neighborhood pride and enthusiasm for the school.

Members of the PTA had prepared all the refreshments, which they served in the school cafeteria. Teachers showed the visitors through the building, having been briefed beforehand on details of its construction. One of the architects reports the guide service was so effective that he himself was taken on a thorough tour by an unsuspecting teacher who capably answered all his questions.

Guests were given program leaflets illustrated with a rendering of the building (see above, left) and listing these outstanding features:

1. Visual education areas in classrooms marked by asphalt tile to show correct areas for seating.
2. Cafeteria doubling as assembly room by use of small speaker's stage.
3. Toilets for boys and girls for each two classrooms.
4. Harmon Natural Daylighting for even distribution of natural light.
5. Mechanical ventilation of classrooms in warm weather through heating duct and roof fans.
6. Allowance for future additions.

(*Continued on page 136*)

THIS MAN IS PAID TO HELP ARCHITECTS AND THEIR ENGINEERS!

He is a specialist in planning and engineering RCA Sound Systems for every type of building: Schools . . . Hospitals . . . Hotels . . . Factories and Offices . . . Churches . . . Department Stores . . . Airports and Terminals . . . Warehouses and Garages . . . Auditoriums . . . Recreational Centers . . . Institutions . . . Stadiums . . .

No matter what size or type of job you have on your drawing boards, you can get practical help from RCA in fitting RCA Sound Systems to your architectural plans. No obligation, of course.

Contact your nearest RCA Sound System distributor or write: Sound Products, Department 3A, Radio Corporation of America, Camden, New Jersey.

RCA
SOUND PRODUCTS
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

THE MASTERMIND OF THE NEW ERA FOR ELEVATORS

*Selectomatic

Selectomatic is an ingenious electrical intelligence with a nervous system that is alert to every floor in a building. It automatically registers all service calls . . . it instantly reacts to answer those calls . . . it continuously regulates the entire elevator bank and automatically matches elevator service to the varying traffic patterns.

Controlling a bank of elevators is no longer a fumbling hand proposition—an operation involving a "starter" who stands in the lobby of a building and makes frantic guesses at when to send which cars where.

This old method, known as signal control, was once adequate, but it hasn't a chance against quick-changing traffic demands in a modern multi-floor building. Solving today's elevator problems calls for a mastermind—and that calls for Westinghouse Selectomatic.

See how you and your tenants can enjoy the benefits in this new era of elevator control. Send for Book B-3597 for the complete story of Selectomatic—Science's Greatest Achievement in Elevator Transportation. Write Dept. D1, Elevator Division, Westinghouse Electric Corporation, Jersey City, N. J. J-98555

YOU CAN BE SURE...IF IT'S

Westinghouse

CONSTRUCTION COST INDEXES

Labor and Materials

United States average 1926–1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assocs., Inc.

NEW YORK

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1941	134.5	135.1	135.1	137.2	134.5
1942	139.1	140.7	137.9	139.3	137.1
1943	142.5	144.5	140.2	141.7	139.0
1944	153.1	154.3	149.6	152.6	149.6
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
1947	219.3	222.0	207.6	207.5	203.8
Aug. 1949	237.3	233.8	240.5	244.0	237.2
Sept. 1949	239.2	236.3	240.6	244.0	237.5
Oct. 1949	242.7	239.4	241.0	244.2	237.6
Oct. 1949	**96.5**	**95.6**	**84.4**	**83.1**	**82.6**
	% increase over 1939				

ATLANTA

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1941	97.5	96.1	99.9	101.4	100.8
1942	102.8	102.5	104.4	104.9	105.1
1943	109.2	109.8	108.5	108.1	108.7
1944	123.2	124.5	117.3	117.2	118.2
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	135.1
1947	180.4	184.0	158.1	157.1	158.0
Aug. 1949	182.6	182.2	177.3	177.9	174.1
Sept. 1949	183.7	183.7	178.4	178.4	174.8
Oct. 1949	184.3	184.7	177.9	177.6	174.7
Oct. 1949	**113.6**	**122.3**	**87.1**	**82.3**	**84.5**
	% increase over 1939				

ST. LOUIS

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1941	118.8	118.0	121.2	121.7	122.2
1942	124.5	123.3	126.9	128.6	126.9
1943	128.2	126.4	131.2	133.3	130.3
1944	138.4	138.4	135.7	136.7	136.6
1945	152.8	152.3	146.2	148.5	145.6
1946	167.1	167.4	159.1	161.1	158.1
1947	202.4	203.8	183.9	184.2	184.0
Aug. 1949	215.9	214.5	210.3	212.3	211.2
Sept. 1949	218.2	216.2	212.9	216.2	214.4
Oct. 1949	218.9	217.1	213.1	216.2	214.5
Oct. 1949	**98.6**	**102.9**	**79.5**	**80.5**	**80.3**
	% increase over 1939				

SAN FRANCISCO

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1941	116.3	112.9	120.5	123.4	124.3
1942	123.6	120.1	127.5	129.3	130.8
1943	131.3	127.7	133.2	136.6	136.3
1944	139.4	137.1	139.4	142.0	142.4
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
1947	193.1	191.6	183.7	186.8	186.9
Aug. 1949	207.1	199.5	212.0	219.3	214.8
Sept. 1949	208.4	200.8	213.6	218.9	214.4
Oct. 1949	212.2	205.8	214.9	219.8	215.0
Oct. 1949	**100.9**	**107.3**	**83.3**	**80.3**	**84.5**
	% increase over 1939				

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

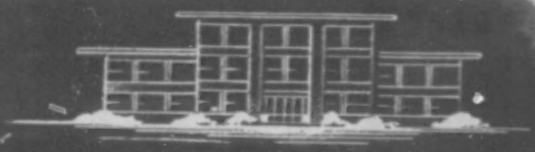
Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.



Of 10,400 School Superintendents 78.4% Would Specify Individual Room Temperature Control!

"THE Ideal School — How Would You Build It?" That's the question *School Management* Magazine asked more than 10,000 school superintendents across the nation. And more than three of every four responses specified individual room temperature control. When asked which features would be eliminated for reasons of economy, individual room temperature control was the last to be mentioned!

Yet these facts are not surprising, for educators have long recognized their responsibility in molding the health habits of our country. And here is evidence that school authorities are fully aware of the need for controlled atmosphere — healthful temperatures, correct humidity and adequate ventilation. When you specify individual room temperature control for schools, educators will be quick to recognize the benefits.

If you would like to see the complete *School Management* survey, Minneapolis-Honeywell, 60-year leader in automatic control, will arrange for the publisher to send you a copy. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

MINNEAPOLIS **Honeywell**

CONTROL SYSTEMS

"Guarding America's Health with Controlled Atmosphere"

REQUIRED READING

Manchu palace in a setting of lakes and islets. Painting in the Bibliotheque Nationale, Paris, reproduced in "Gardens of China"

WORK OF ART

Gardens of China. By Osvald Siren. The Ronald Press Co. (15 E. 26th St., New York 10, N. Y.), 1949. 9¼ by 12 in. 141 pp. of text + 208 pp. of plates. $30.00.

The ancient gardens of China illustrated in this sumptuous volume should interest the modern reader on many levels of appreciation. Even a glance will reveal their timeless beauty. But with our own contemporary landscape design in a period of changing concepts, it is also most timely to examine the theories which have produced such obvious and satisfying beauties for another culture.

The essence of these gardens, the author believes, lies in a peculiarly intimate kinship with nature. Thus the aim has always been to create a blending of natural and man-made elements rather than to effect a rational organization of pattern. Stemming from an imaginative appeal, the Chinese garden can truly be described as "a work of art in the forms of nature."

In two major sections, this book considers the creative elements which have made such works of art, first from a theoretical viewpoint and then as portrayed in examples from existing gardens. The author has drawn a wealth of material both from his own travels and from Chinese texts, and the entire volume has a richness suggesting the vast extent and varied culture of the land itself.

Viewing the forms of nature in the widest terms, the elements from which the Chinese created their gardens extend far beyond the flowers and trees which have dominated western gardens. Perhaps the most unique and specifically Chinese features are the so-called "mountains," or fantastic garden stones, which fulfill somewhat the same function as statues in an occidental garden, while at the same time merging more naturally with their surroundings. The frequent appearance of ponds and canals emphasizes a use of water for its evocation of mood and motion.

Since the Chinese made no sharp distinction between indoors and out-of-doors, gardens were seen as natural extensions of their dwellings and architectural elements are another essential in the composition. In the fusion of picturesque elements which was so highly prized, a free use of pavilions, walls and galleries served to accent, contain and link the individual units.

This philosophy takes on a concrete meaning in the second major portion of the book. After discussing the significance of Chinese gardens in literature and in their adaptation by Japan, there are detailed descriptions of some of the palace and private gardens of China. To western eyes the relative importance of town gardens is perhaps surprising. And yet, as a Chinese treatise asks, "If one can find stillness in the midst of the city turmoil, why should one then forego such an easily accessible spot and seek a more distant one?"

In format this book beautifully supports the beauty with which it deals. Color reproductions from eleven Chinese woodcuts remind one of the close relationship between Chinese art and gardens. Photographs, plans and drawings are included throughout the book and there is a magnificent selection of plates with which to close.

Like the Chinese garden itself, this is a book to revisit many times. Whether one dwells at length on the informative text or merely browses through the many delights, it should prove equally rewarding.

HISTORIC HOUSES IN COLOR

A Treasury of Early American Homes. By Richard Pratt. Whittlesey House (330 W. 42nd Street, N. Y. 18, N. Y.), 1949. 13½ by 10½ in. 136 pp. illus. $12.50.

Since adults are seldom vouchsafed a book in full color, the brilliant kodachrome photography — not just in one special section but on virtually every page — is the most newsworthy feature of this fine collection of Early American houses. Fortunately the author's text and editing are worthy of his illustrations.

A commission from the Curtis Publishing Company for a series of magazine articles made it possible for Mr. Pratt to undertake the job of locating, selecting, and photographing the houses which best represent American building tradition before 1850. Some are familiar buildings now open to the public as museums, and others are private homes photographed by permission of sympathetic occupants. George Washington and other notables really slept in some, and John Doe and Richard Rowe in others, but each is included because it represents one particular way Americans have lived.

From Woodstock to Natchez and even Monterey, we are shown houses built with gracious details copied from European builders' handbooks, but planned by imaginative owners to suit their colonial needs, and to use their own materials: native Pennsylvania stone in Bucks County; oyster shell stucco in Charleston; ships' timbers on Cape Cod.

Their survival alone shows that these are good houses — well constructed and well cherished. Houses which copy them lack, as the author notes, "the impulse of the originals . . . along with yesterday's necessities." But the beauty of their details, and the rightness of their plans, provide standards of achievement and make them, to quote again from Mr. Pratt, "among the things to keep in mind while planning for the future." This spectacular presentation in color should bring them to the attention of a great many laymen as well as architects who are interested in such planning.

(*Continued on page 30*)

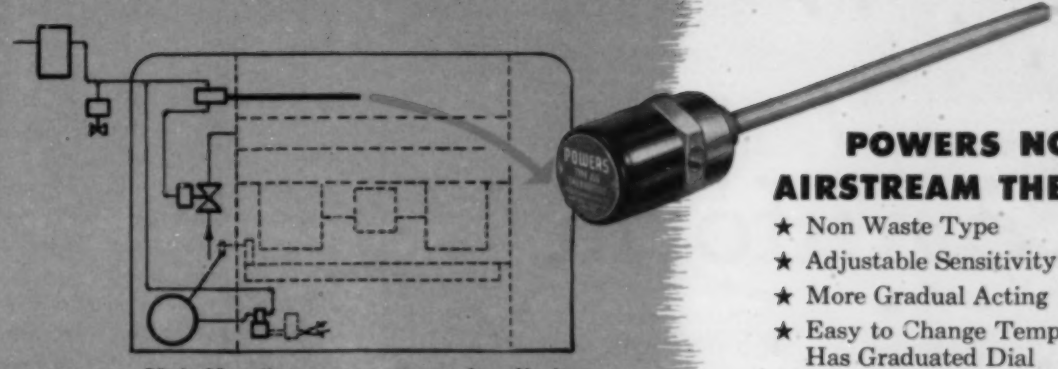
Whether Ventilation is by Central or Unit System...

POWERS

GIVES EXTRA FEATURES

—where it is important!

UNIT VENTILATOR CONTROL—Requires Low Limit Thermostat with advantages listed below—

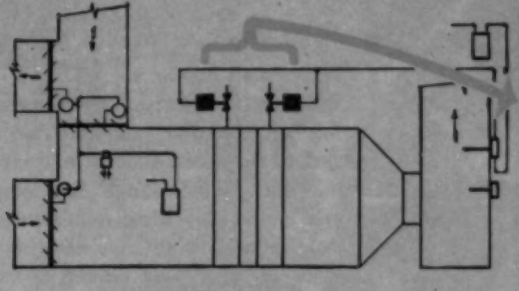


Unit Ventilators operate on low limit thermostat a large portion of the time.

POWERS NO. 356 AIRSTREAM THERMOSTAT

- ★ Non Waste Type
- ★ Adjustable Sensitivity
- ★ More Gradual Acting
- ★ Easy to Change Temperature Setting Has Graduated Dial
- ★ No Restriction Valve to Set

CENTRAL FAN SYSTEM CONTROL—Requires Proper Valves



POWERS METAFLOW VALVE

- ★ Low Hysteresis
- ★ Large Power Factor—opposed by heavy spring for smoother operation
- ★ Exposed Adjustable Spring to Insure Proper Sequence Operation
- ★ Exposed Valve Stem Packing Adjustment
- ★ Valve Stem Lubricator Optional

Only one of the many types of POWERS valves.

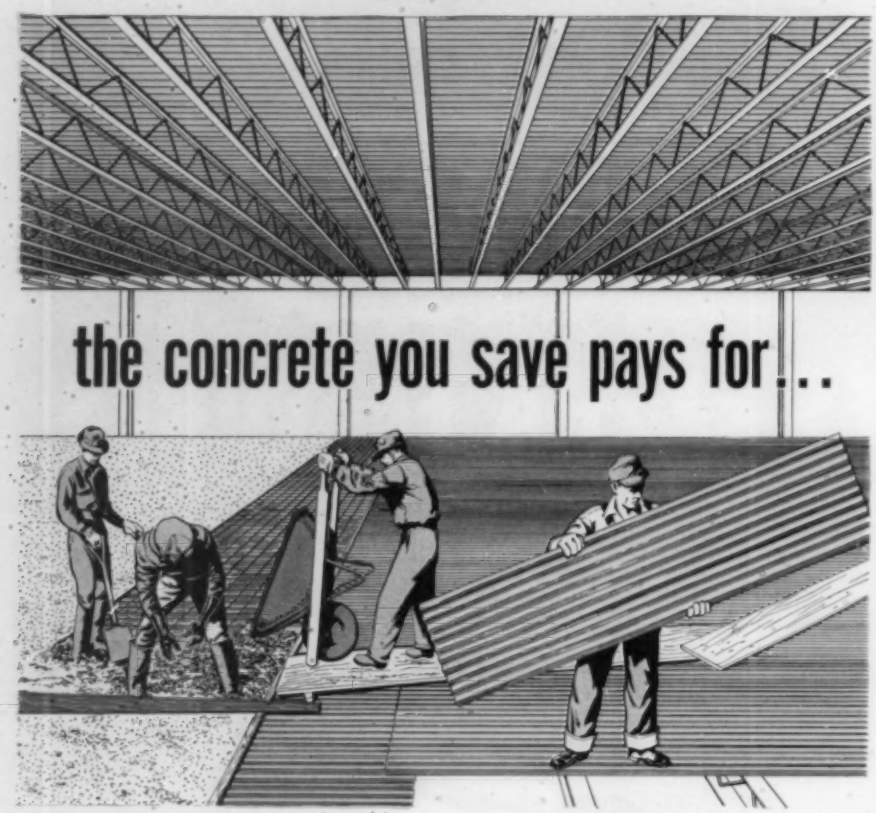
When You Need Help with your problems of temperature and humidity control take advantage of our 58 years of experience in this field. There's no obligation... Contact our nearest office.

CHICAGO 14, ILL., 2752 Greenview Ave. • NEW YORK 17, N. Y., 231 East 46th Street • LOS ANGELES 5, CAL., 1808 West Eighth Street • TORONTO, ONT., 195 Spadina Ave.

THE POWERS REGULATOR CO.

OFFICES IN 50 CITIES • SEE YOUR PHONE BOOK

RC2



the concrete you save pays for...

Corruform

100,000 pounds per square inch.

Tough-tempered. High-strength.
Steel base for concrete in joist construction.

Corruform pays for itself with the concrete it saves. That's because Corruform is tough-tempered to spring back under construction abuse and carries concrete over joists without sag, stretch, bend or leakage. Tough-temper, high strength Corruform, made by processes patented by Granite City Steel Company, is nearly twice as strong as conventional steel of the same shape and weight.

Furnished uncoated, mill-primed for painted exposed joist construction, or galvanized . . . with clips to fit all standard joists. Send for AIA file today.

Specify CORRUFORM by name

Guarantee

Standard tough-temper Corruform is made to one specified strength and thickness with guaranteed average strength over 100,000 p. s. i. and certified minimum strength for single test over 95,000 p. s. i.

GRANITE CITY STEEL COMPANY

Granite City, Illinois

Granite City Steel Co., Granite City, Ill.
Please send me your Corruform booklet.

Name _____

Street _____

City _____ *Zone* _____ *State* _____

THE RECORD REPORTS

BOOKS

(Continued from page 28)

BETTER NATURAL LIGHT

Building for Daylight. By Richard Sheppard, F.R.I.B.A., and Hilton Wright, A.R.I.B.A. Macmillan Co. (60 Fifth Avenue, New York 11, N. Y.), 1949. 8½ by 10⅞ in. 91 pp. illus. $5.50.

Getting natural light into buildings erected for shelter and safety is an age-old problem of architectural design. To its contemporary solution this British book contributes methods for calculating available daylight, studies of orientation and window design for various types of buildings and sites, and a discussion of the uses of various forms of glass. The authors' findings should prove useful in projects where maximum daylight is desired, but little mention is made of the supplementary importance of artificial lighting.

An introductory historical note by John Gloag traces the development of windows in Britain, from Roman times down to the present.

Wash drawings of typical period window treatments illustrate the historical section, and the contemporary section contains useful diagrams for the orientation and grouping of buildings.

SHADOWPLAY

Profile Art. By R. L. Megroz. Philosophical Library (15 E. 40th St., New York 16, N. Y.), 1949. 7¼ by 9½ in. 131 pp., illus. $7.50.

Ever since the earliest known works of prehistoric art, the silhouette has appealed to the creative artist and craftsman. With this volume the general reader can survey some manifestations of the method, from cave art through the art of Egypt and Greece down to present times.

Although the emphasis is primarily on the past, a section illustrating decorative uses of the silhouette in such diverse forms as marquetry, tiles, wrought iron and textiles has direct contemporary interest. As fillip there are side excursions into such fields as phrenology and comic art. With perhaps a certain British detachment, there is a bare mention of American cartoons and films, but the subject matter chosen is nicely illustrated and varied in scope.

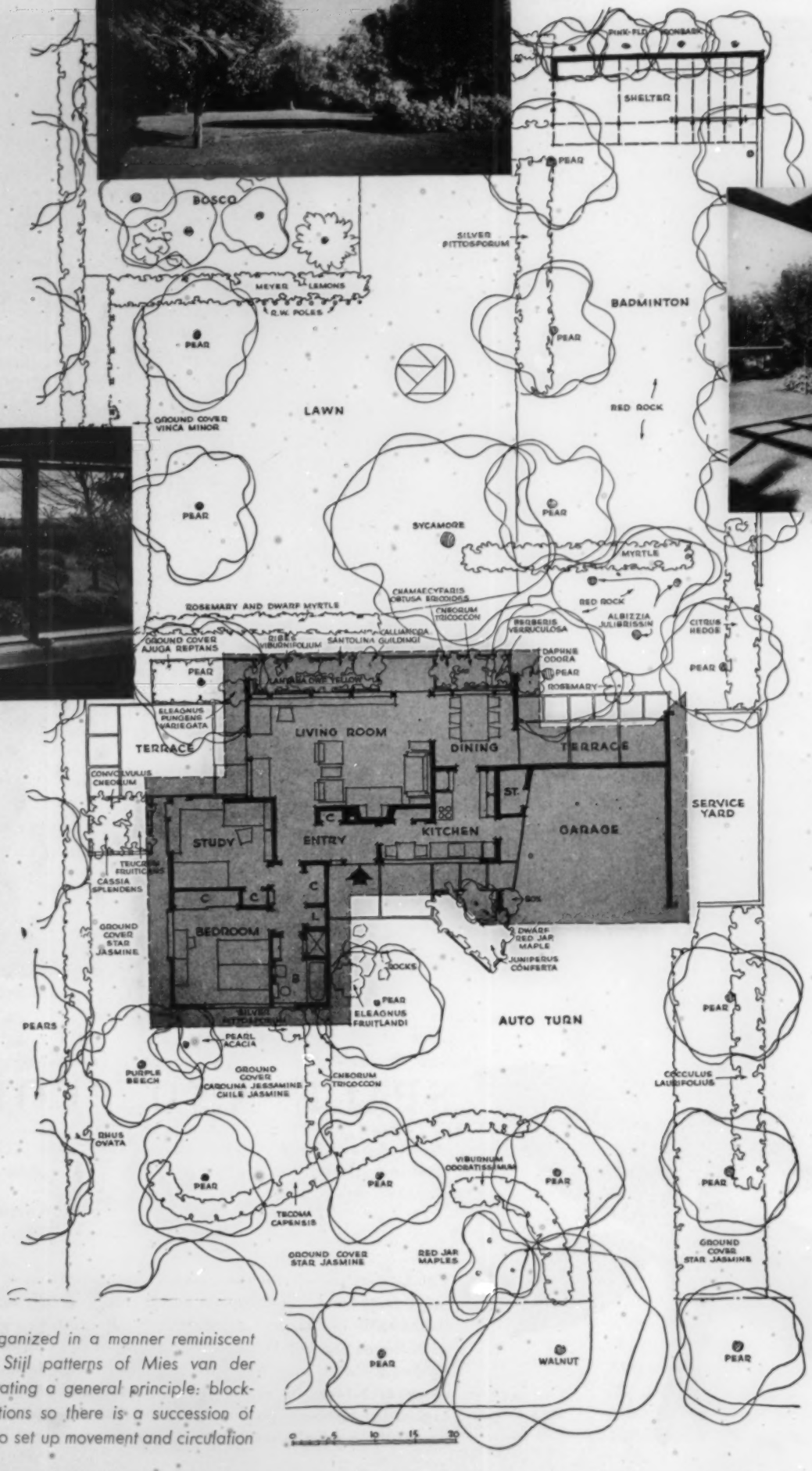
Philip Fein Photo

SPACE AND PEOPLE

by Garrett Eckbo

The Editors present in these pages a condensation of part of an important book, "Landscape for Living," which will be published early in 1950 by ARCHITECTURAL RECORD in collaboration with Duell, Sloan & Pearce. The author, of the California firm of Eckbo, Royston and Williams, planning consultants and landscape architects, is interested and experienced, not alone in organizing outdoor space to fulfill definite functions, but also in positively, humanly relating it to people.

Philip Fein Photos



Garden, organized in a manner reminiscent of the de Stijl patterns of Mies van der Rohe, illustrating a general principle: blocking off portions so there is a succession of views and to set up movement and circulation

"Gardens, like houses, are built of space. Gardens are fragments of space set aside by the planes of terraces and walls and disciplined foliage. Until now we have defined too nicely the differences between that space which is roofed and within the house and that which is left outside and round the house. We did not see, until the architect threw down his walls, that the space of house and that of garden are parts of a single organism: that the secret of unity lies in a unity of spatial sequences. The new vision has dissolved the ancient boundary between architecture and landscape architecture. The garden flows into and over the house: through loggias and courts and wide areas of clear glass and over roofs and sun rooms and canopied terraces. The house reaches out into the garden with walls and terraced enclosures that continue its rhythms and share its grace. The concordant factor is the new quality given to space." — *Joseph Hudnut*

PEOPLE live ON the earth, ON the land, but IN the three-dimensional air-space, the atmospheric volume, immediately above this land surface. Plans and land-use maps may be measured diagrammatically and abstractly in square footage and acreage, but space for living is measured in cubage, in volumes of air-space enclosed or organized with tangible physical elements. The term "space" may be used scientifically by astronomers, demagogically by reactionary politicians, and abstrusely by artistic intellectuals, but to ordinary people it has an ordinary practical meaning — room to live in, to work in, to play in, to relax in.

Every piece of land which is set aside by legal property lines as being within the private ownership of some individual or organization is really a block of space, a volume of atmosphere, bounded by vertical planes projected from the property lines, with a third dimension adequate to include the development programmed for that land, whether it be a one-story house or a sixty-story skyscraper. The real estate, the land, is only the floor, the bottom side of this space for living. It provides a foundation for structures, a root medium for plants, a source of raw materials, but the volume above it is the primary element.

If the land has some irregularity or slope it has to that extent a third dimension which produces some sense of volume, determined by the vertical pull of gravity. Beyond that, every element, every rock, every hole or gully, every bush or tree, every wall or pole, every object alive or dead, moving or stable, produces a physical organization and definition of space, gives it tangible comprehensive form, encloses it, puts it under control, or puts it in motion around focal elements, all with tremendous variations in intensity, precision, strength or subtlety, and sensations resulting in the person or persons within that space. The land, the air-space, and the physical elements and materials on the land are all mutually interdependent — land and super-surface elements give form to space; space displays the form of land and elements. Space sensation very simply is the aggregate of all the physical sensations one experiences in a given place at a given time.

We live continuously subjected to spatial sensation, wherever we go, indoors and out, from birth to death. The experience of space is a common and vital human experience, comparable to those of food, sleep, clothing, or sex. We all remember childhood and youthful experiences of pleasant and unpleasant spaces — backyards, sheds, attics, playgrounds, railroad yards, beaches, streets and alleys, basements — and their effect upon our growing awareness of, and attitude toward, the world around us. This sensitivity seems to get dulled, or submerged to the subconscious, as we grow older. Perhaps this happens because the spatial experiences of the majority of the population are quite poverty-stricken. The American scene — Main Street, urban housing, the standard residential suburb — has a general commercialized sterility which is far below the technical and esthetic potential of our culture. This is the richest country in the world, yet most of our buildings are badly proportioned, skimpily planned, and of a monotonous and deadly similarity. Even our architects tend to insufficient concern with spatial experience, and to dull, stereotyped, monotonous work. Our outdoor experiences are somewhat more varied, but there is the same tendency toward repetition of a dull and tired formula in streets, and in gardens and parks where they exist. Speculation in land and its chain of shoddy and miserly land use and space conceptions have produced the poverty of space for most American people, and the poverty of people for most American space, which is the basic contradiction of our environment. This is expressed statistically in terms of housing, slums, juvenile delinquency, fire risk, etc., and without statistics in a general neurosis, a general worry and hostility, jangled nerves, and the constant urge to get away from whatever place we happen to be in.

Space, beginning as necessity and ending as luxury, is one of the primary conditioners of human development. Measured in square or cubic feet per person, qualified by the character of its organization, it is one of the basic gauges of the quality of our living environ-

Extending space organization on a steep lot by projecting a trellis to increase security and heighten relationship of house to view

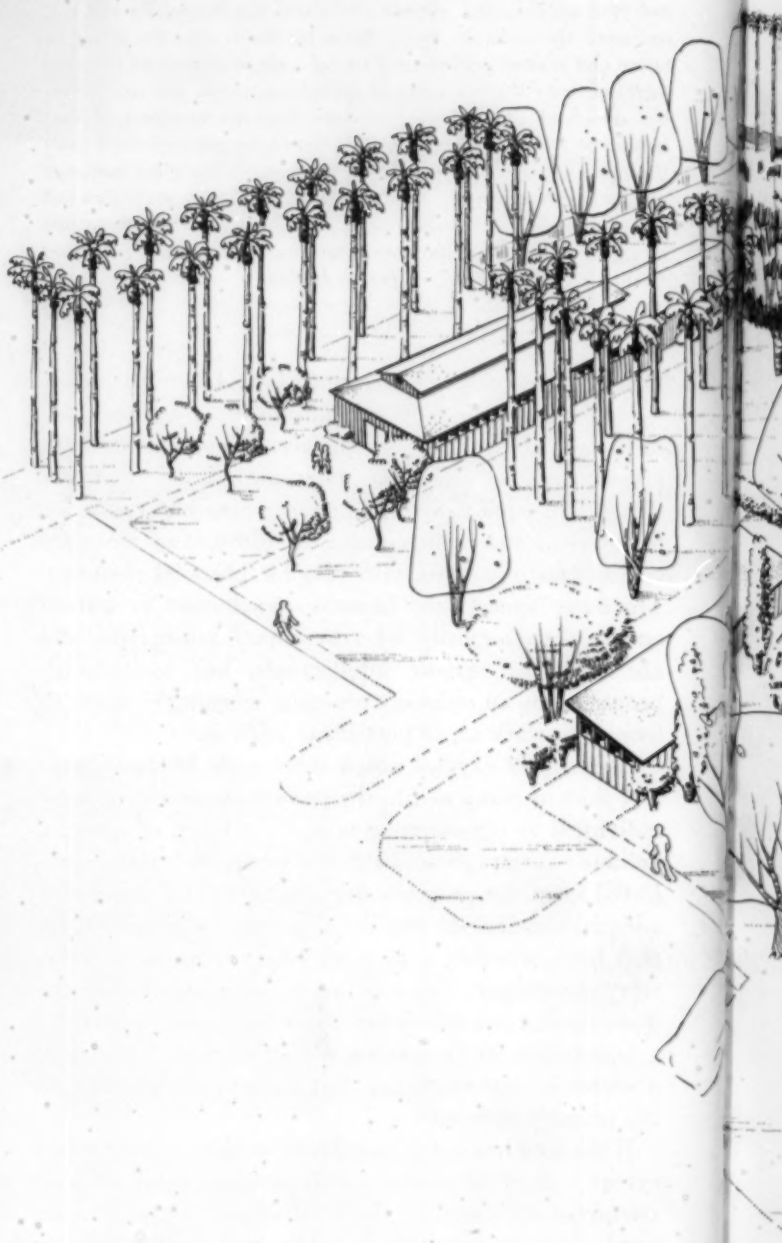
ment. A future science of the space we live in will establish standards for full American living which will be optimums rather than minimums (which quickly become maximums) — as, hypothetically, 1000 square feet for a two-bedroom house. The relation of such standards to the health of the nation has yet to be measured. Families with one or two children can be found living in any size unit from 500 to 15,000 square feet; most are probably living in less than 1000. How can we explain this spread in accommodation, save in terms of luxury and scarcity? — this conspicious consumption of space by a few; the conspicuous consumption of the many by the inadequate space left over?

Artists and architects cannot escape the impact of such contradictions. The architect is led to concern with the contradiction between our advanced building technology and our advanced housing crisis, between the potential richness and the actual poverty of our general physical habitat, in his specific struggles with the contradictions between space and structure expressed as needs vs. restrictions, biology vs. cost, and so on. Thus we encounter rationalizations of the reduction, by economic pressure, of the $10,000 house from 2000 square feet in 1928 to 700 square feet in 1948; houses have grown as they have become smaller; in them, many areas must serve several different functions.

While space concepts vary among modern buildings, they agree in general in being more open in plan and in exterior walls than traditional buildings. That is, they have moved from the concept of a building as a mass or block, with holes punched in the sides for light, air, and access, toward the concept of buildings as free and flexible arrangements of wall planes, some solid and some open, between floor and roof planes. The early work of Mies van der Rohe is perhaps the best example of this latter concept; it eliminated more preoccupation with facade and sculptural or plastic qualities than that of other leaders. Gardens and landscapes in general are apprehended only from within themselves; they do not have the outside walls or facades which still make it possible to walk around most buildings, however modern, and view them as objects, more or less sculptural, in the landscape. Only from an airplane or a high place can one view gardens or landscapes from outside themselves, and their scale changes radically in the process of getting so far above them.

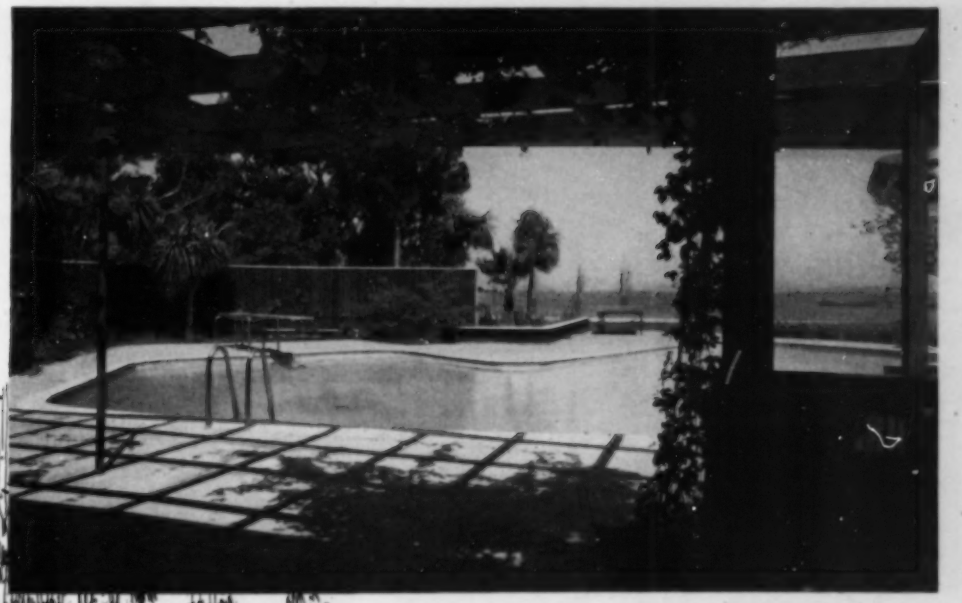
Space Formation

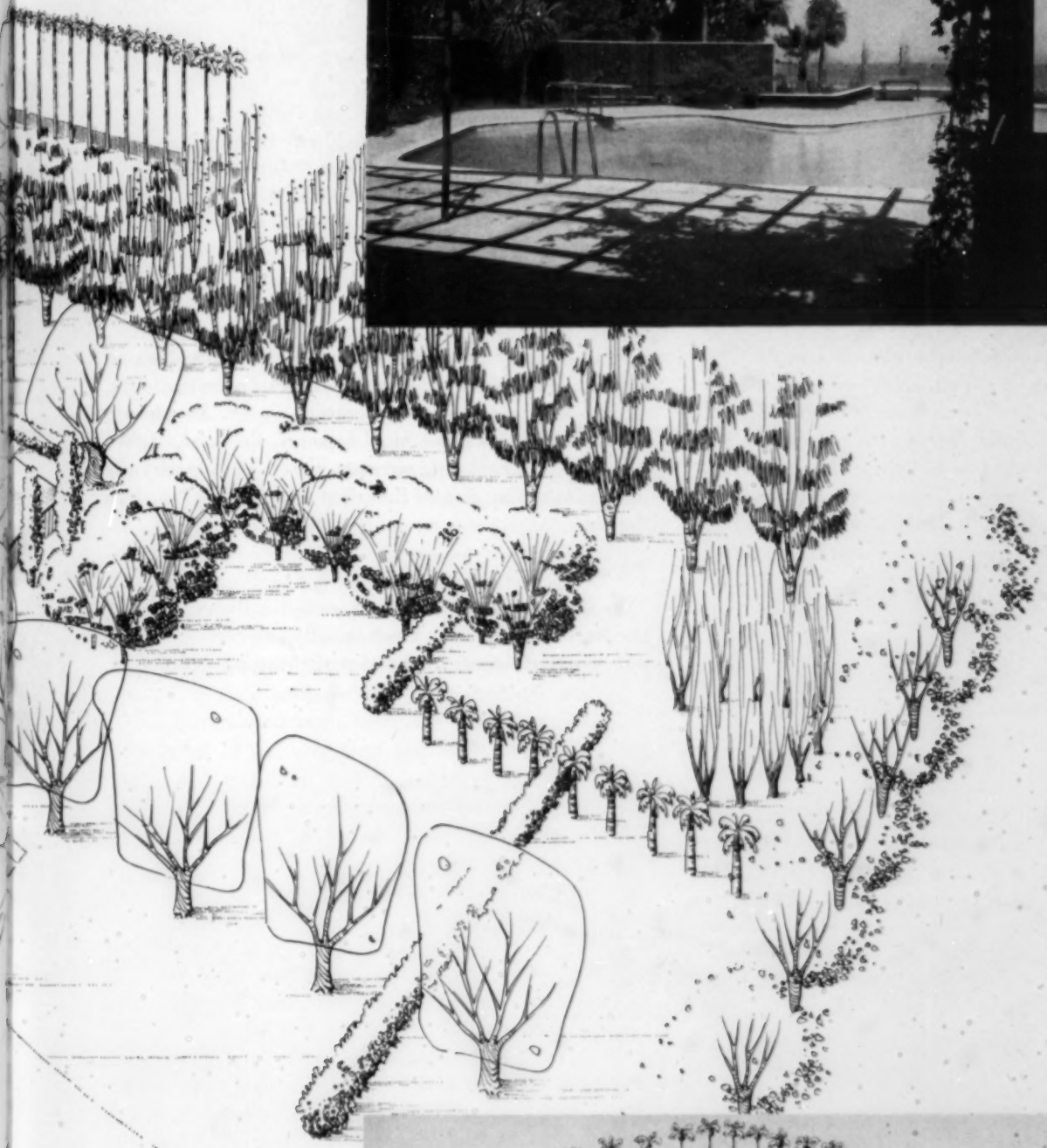
We are not here to advance rules or formulae for the new concept of space-form in the landscape. However, we can suggest the direction. The practical will become esthetic and the esthetic practical. The practical solution of almost any landscape problem will take the following steps: surfacing, enclosure, enrichment. Instead of concentrating on enrichment elements — pictures, "compositions," patterns, flower borders — we will tend to concentrate more on sensitive and imaginative selection and arrangement of enclosure and surfacing elements. Such concentration, while it establishes a framework or shell within which any amount of further en-

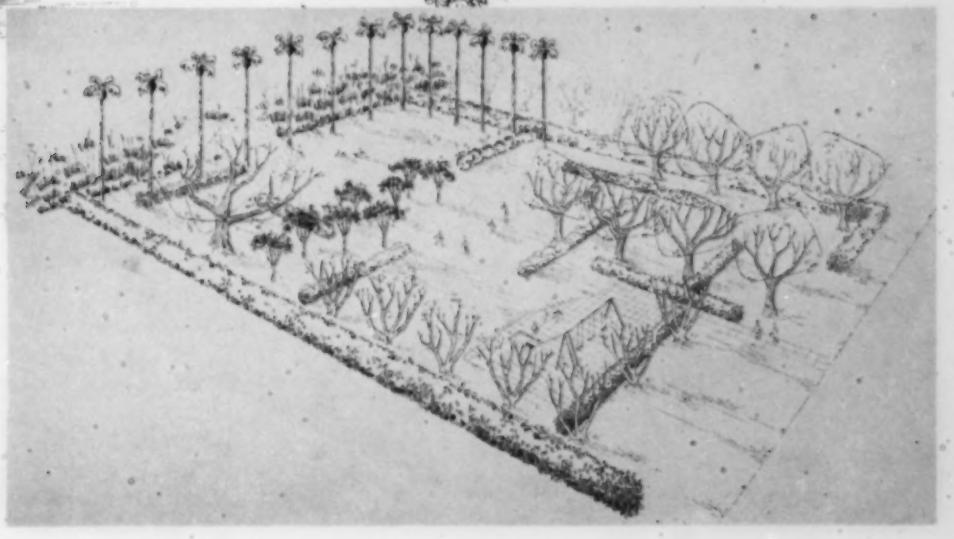


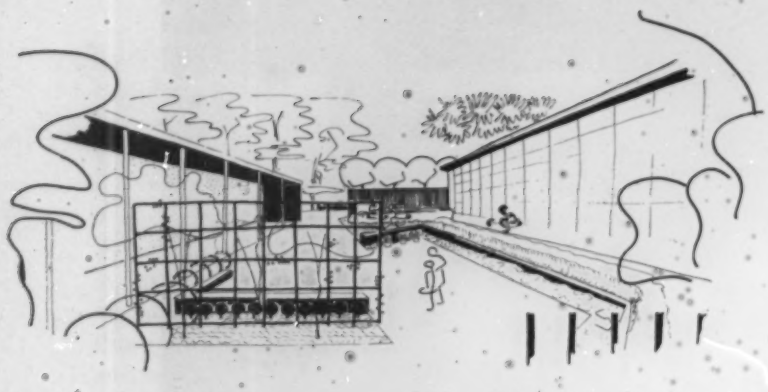
Top right: composition integrating a functional swimming pool with surrounding countryside by continuity of structural and planting patterns. Center: development for a community center, more complex than the standard open-meadow park, indicating potential variation in grass-shrub-tree relationships. Bottom: space organization for a small, level park; compare with garden, p. 70

M. Halberstadt Photo







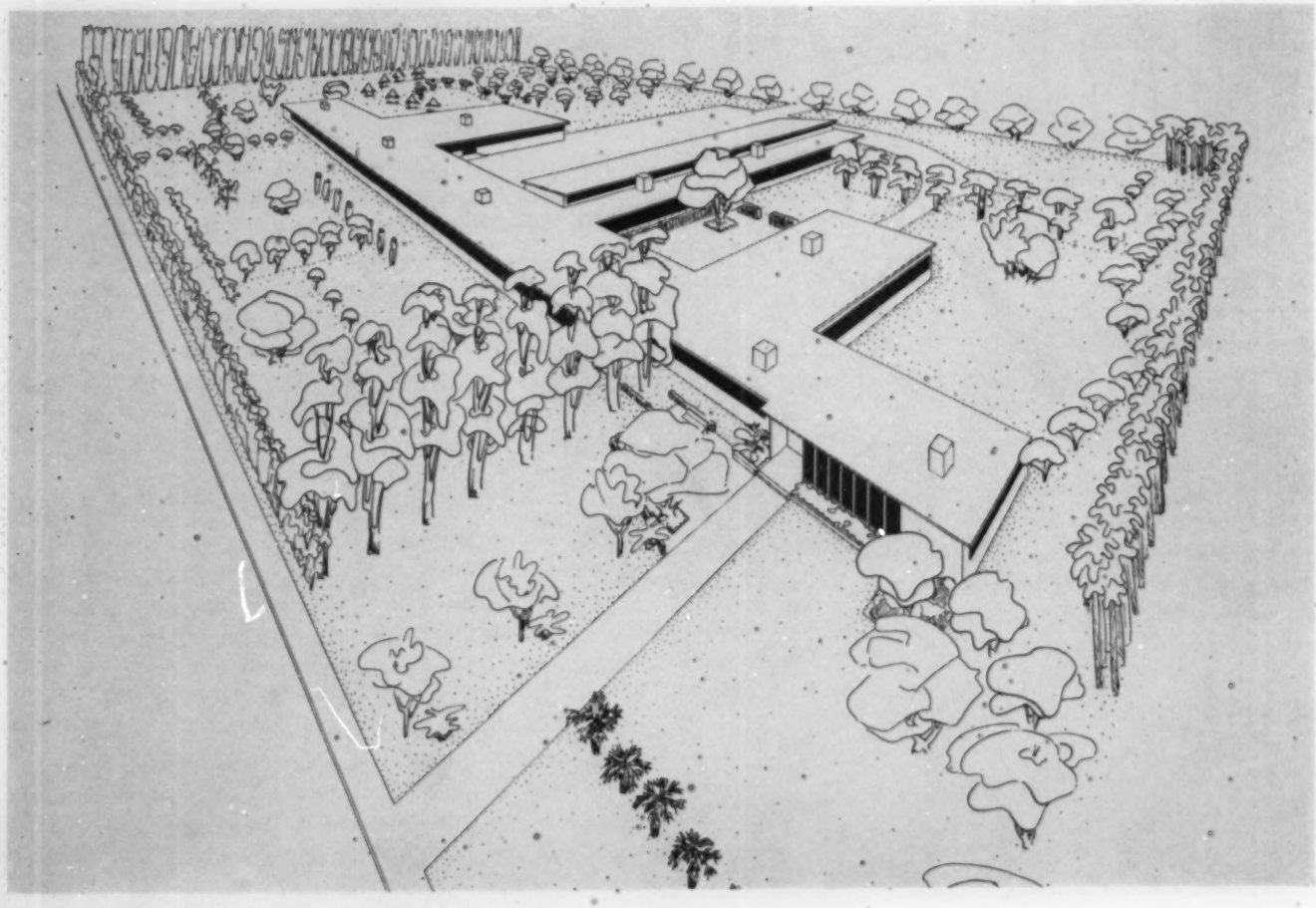


Left: refinement of long, narrow courts (here, in a college science building) by means of simple structural elements, improving three-dimensional proportions. Bottom of page: providing maximum visual satisfaction for patients confined in a long ward wing which has a continuous glazed wall. Typical of many contemporary buildings, this seems to demand a pleasant outlook from windows rather than a building setting to be viewed from the street

richment can be woven into the overall harmony, is equally satisfying with no more than the greatest enrichment of all — human life and activity. For a really full and well-rounded scientific art of space organization, outdoors as well as in, will proceed always with two primary ideas in mind. These can be contradictory or complementary as they are interpreted by specific designers in specific situations. One is the objective of giving the richest, most plastic, and satisfying form to the space which is being organized; the other is to concentrate always on that space as an arena, volume, background, and shelter for human life and activity. People are its primary content; without them it becomes an empty abstraction, exterior decoration, excess gilding, as so many great historical gardens were. People are the focal points, the terminal features, the final vitality of any spatial enclosure we may create. That is why the open center may almost be called a principle of modern design.

People

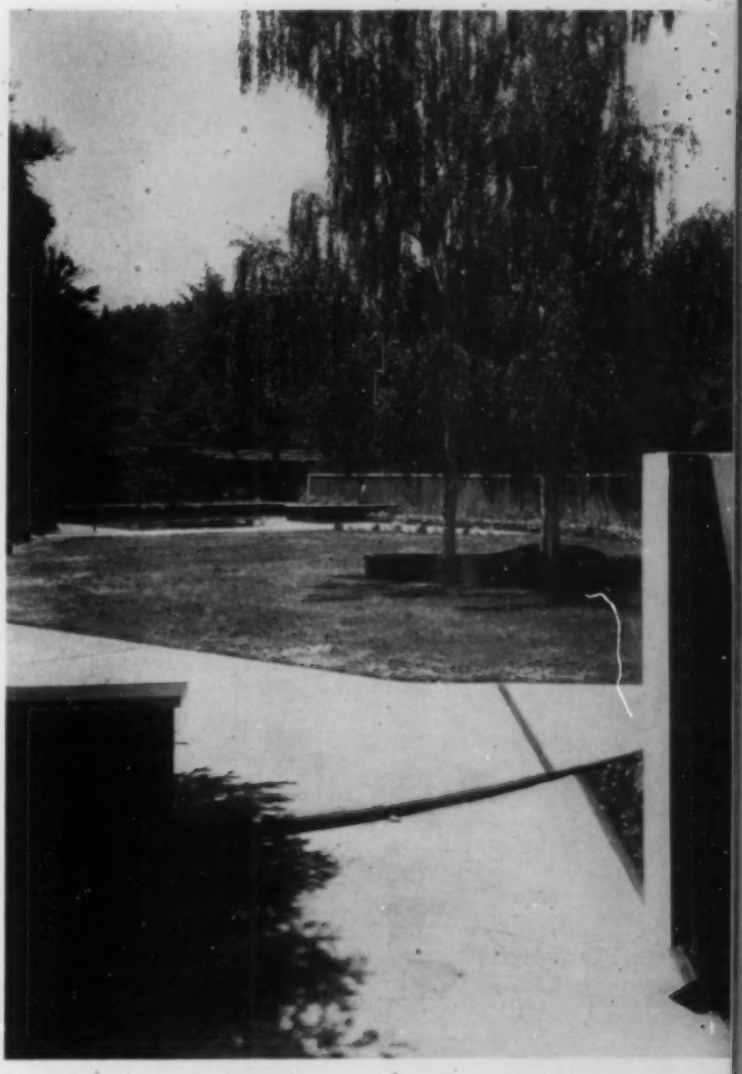
People are seldom discussed, realistically and sympathetically rather than mechanically, as essential components or elements of theories of planning and design.



Yet it is useless to project a science and an art of fine and handsome space organization unless we project also fine and handsome people within that space. Nor can we project the expansion of this fine and handsome space organization throughout the greater part of the physical environment unless we can also project the majority of the population of that environment as being equally fine and handsome. If our concept of design is held on a higher plane than our concept of people, we introduce a basic contradiction into our work which will make it impossible to continuously broaden and enrich it.

Is art for art's sake, or for people? If the latter, is it for a majority or a minority? If the latter, which minority? If it is true that "landscape design can be truly appreciated only through the eye and mind which are trained to see and understand," * how and by whom is appropriate training provided for our clientele? Is it only the individual private clients who get this training? How about the majority who experience our park designs? Do they require a course of training before they can enjoy them? Or do we reserve the finer concepts for the more understanding private clientele, and design down to the broad masses? And so on — each question begets another. Our work is done for people, to provide settings and surroundings for their life and activities. Therefore all its forms must relate definitely to the forms of people: to their size, their shape, the way they move about and relax, their requirements as to air, sun, shade, the way in which they perceive their surroundings, and so on. This observation may seem simple and elementary to the point of naïvete, until one looks about with open eyes and sees how seldom our environment is really formed to fit the simple and fundamental needs of the people who must live in it. If human life on an individual and dignified scale had been considered of primary importance by the most responsible citizens, our cities would never have become as congested, filthy, and sordid as they are.

Knowledge of such mechanical factors as eye-height, stride-length, and adaptability to sun and shade is not enough. People are not robots or sheep. They are all alike and yet they are all different. That is a remarkable thing when you consider that there are some two billion of them in the world. We must also understand their subjectivity, inconsistency, and contrariness, and the forces that make them greedy, intolerant, confused, mean, belligerent, irresponsible, cynical, or vulgar. We must realize that those qualities in adults are environmental rather than hereditary. We must be scientists as well as artists of the environment. From this will come a firm conviction of the basic decency, dignity, friendliness, and creativity of the vast majority. As we said in 1942, at the beginning of the great production of American war housing, every technician involved in developing environments for people is responsible not just for providing shelter, but also for developing their fundamental potential dignity.



Positive structural space formation, relatively large scale, bordering a wooded site. Curved solid screen gives a sense of enclosure; the "volumes of air space (are) enclosed or organized with tangible physical elements"

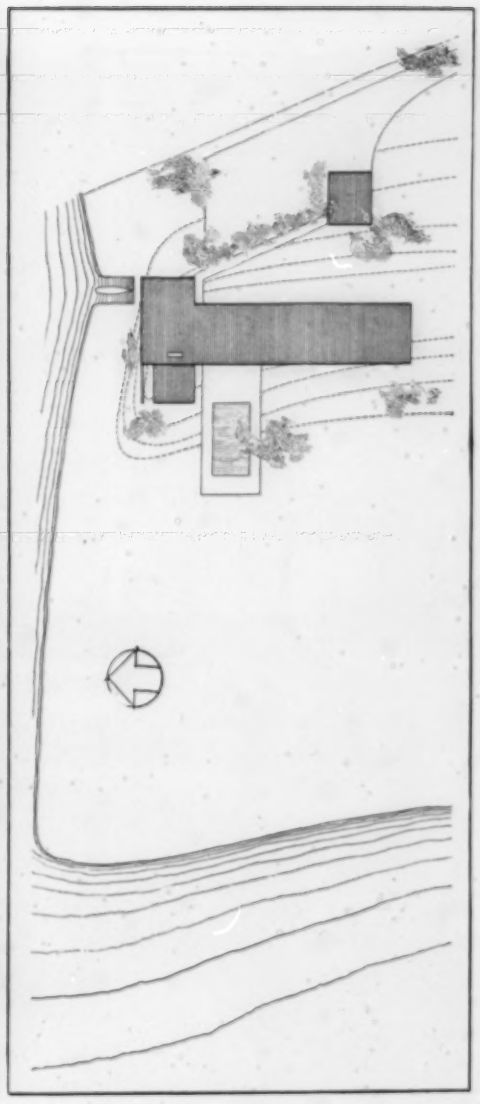
---

* *Landscape Architecture Quarterly*, July 1937

FOR JOYOUS LIVING AND FIVE CHILDREN

Ralph S. Twitchell and Paul M. Rudolph, Architects

Ezra Stoller Photos



Residence for Mr. and Mrs. Maynard E. Russell

Sarasota, Florida

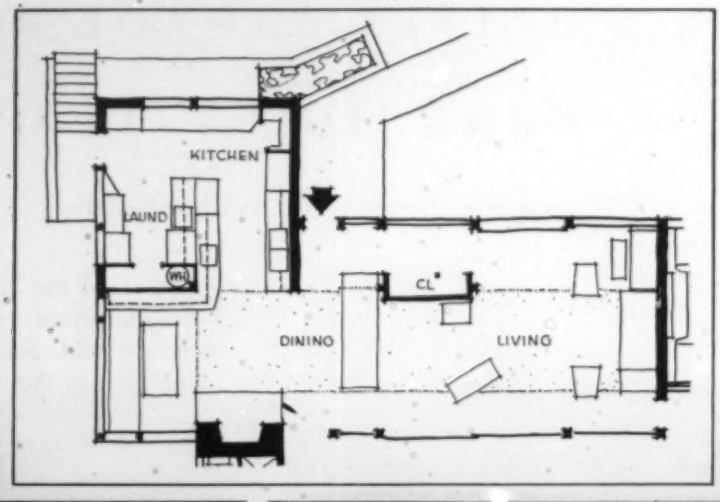
ONE could use all of the familiar words of modern architecture to describe this house, but they all seem too cold. Something like "functional design for living" is too flat a phrase to describe the bubbling joy of five small children in this house, or the cordial family harmony so positively fostered by this plan.

Take for example the site development (at the left). The combination of pool, house and boat landing proclaims a scheme of living in which fun and sports take precedence over formal pretentiousness. And the house settles under the trees comfortably and without self-consciousness.

Or take the family living areas shown on the next two pages. This is as thoughtful an arrangement of space as has been seen in many a year. Here again the planning vocabulary is too cold. The kitchen-dining space combination bespeaks not only utility and informality, but a hearty family gathering at mealtime. The living room, though not at all stiff in itself, nevertheless carries a suggestion of more orderly gatherings. One of the architects casually referred to the dining room as the "winter living room," and explained that the more open living room might seem chilly in cold weather, but the subtle differences between the two rooms are not mere matters of climatic temperature. And one ventures the opinion that as the children grow older these temperamental aspects of the two rooms will be more and more appreciated. Also, when the parents tire of the record-player they may either banish the children to the lanai, or retire themselves to the quiet of the study, which is just behind the dining room fireplace.

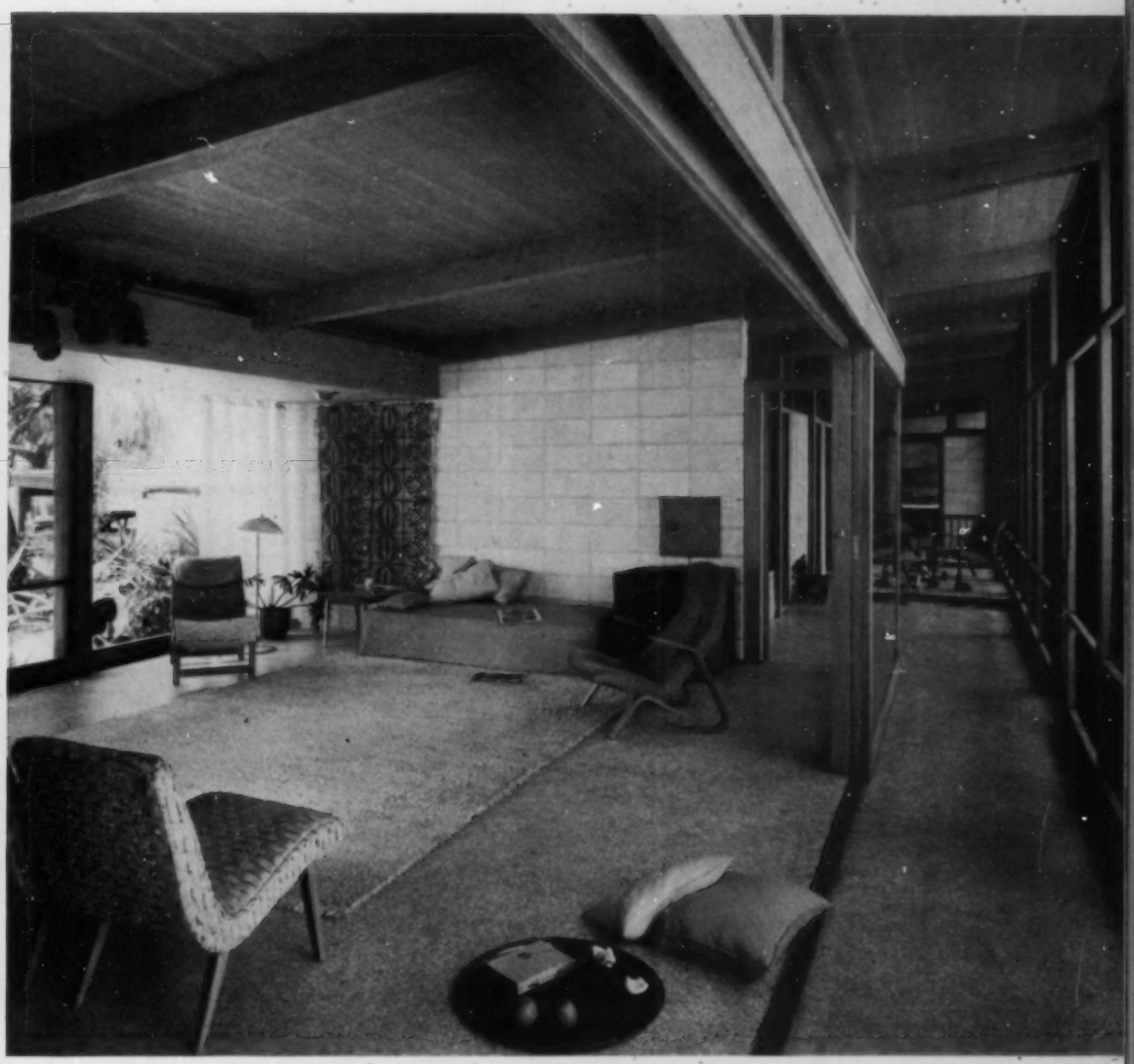
The lanai (photo, page 80; plan, page 81) is an open, screened, widened bedroom corridor which is really a children's activity pavilion with scope for indoor rolling stock. There is, incidentally, a true children's garage on the lower level just under the kitchen, the real parking place for outdoor rolling stock (it may be seen in the photo on the front cover).

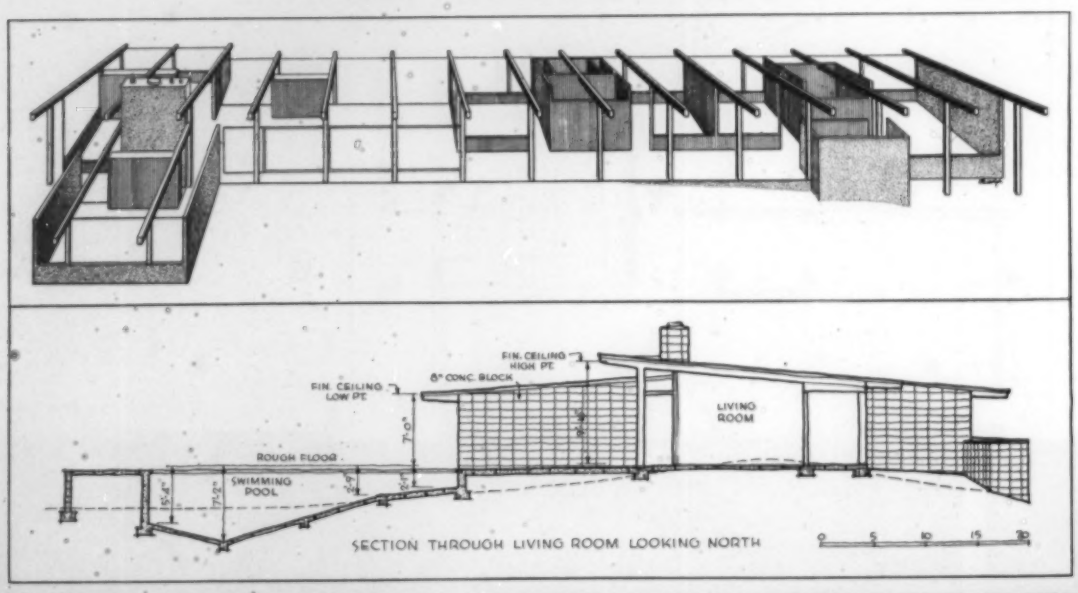
As an example of architectural design the house is quite deserving of all of the words, too — it uses materials appropriately, it has an interesting structural system, it is free and honest and expressive. But surely all these things pale beside the success of the house as a parti for family life. This is no "machine for living"; it is functional architecture, but you must drive the word pretty hard to make "functional" mean as much as it does here.



The laundry and kitchen combination is quite good, but its success in efficiency is nothing to the success of the dining room as an invitation at mealtime. Here a father and five children have room, and welcome, for a gathering before, during and after meals, where mother may win help as well as friends. After meals the activity can flow easily into the living room, or beyond to the lanai, or it can burst right on outdoors. The wall (extreme right in the photo strip) is merely screening; living room and bedrooms can be closed against chilly weather with sliding glass doors

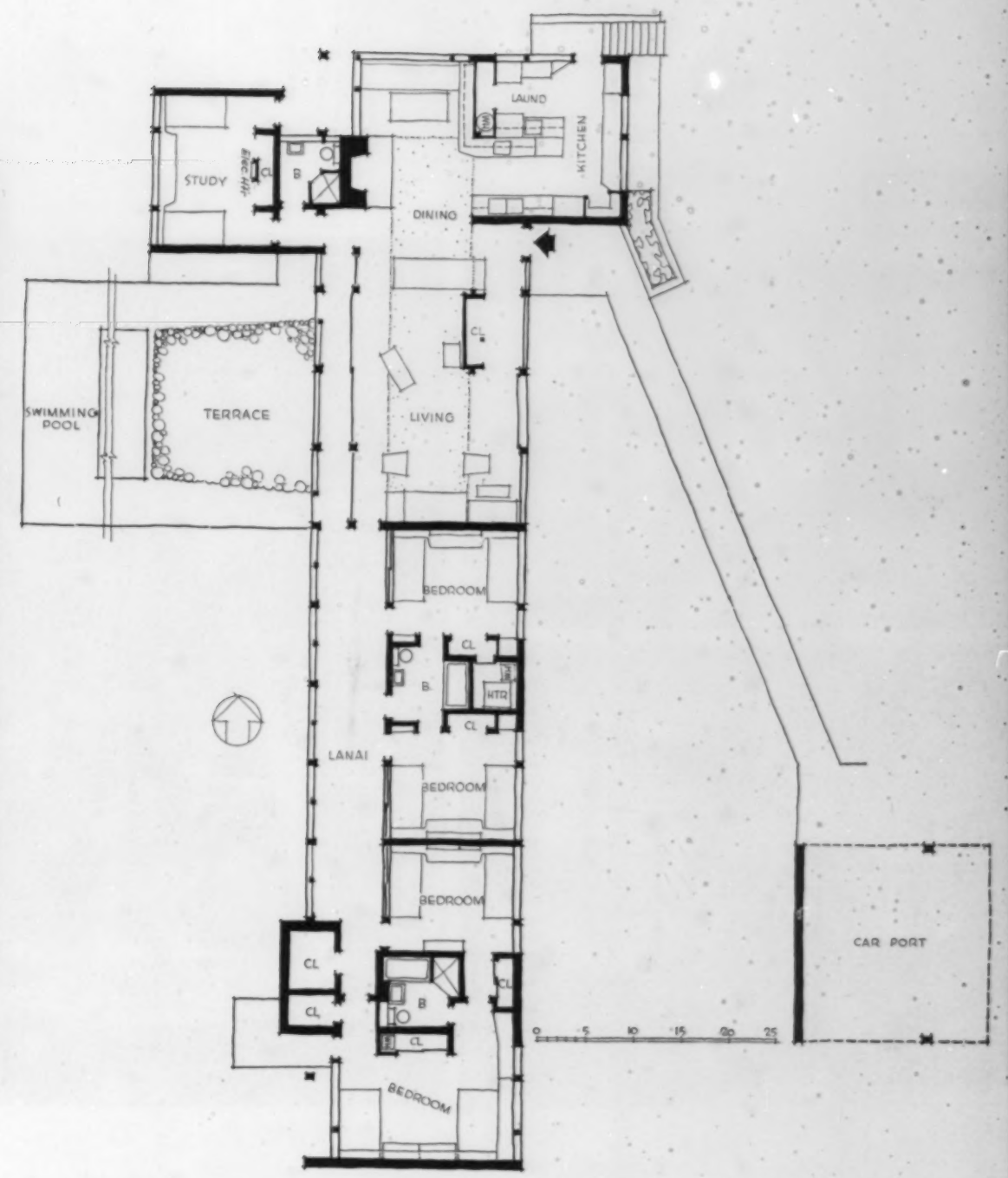
Ezra Stoller Photos

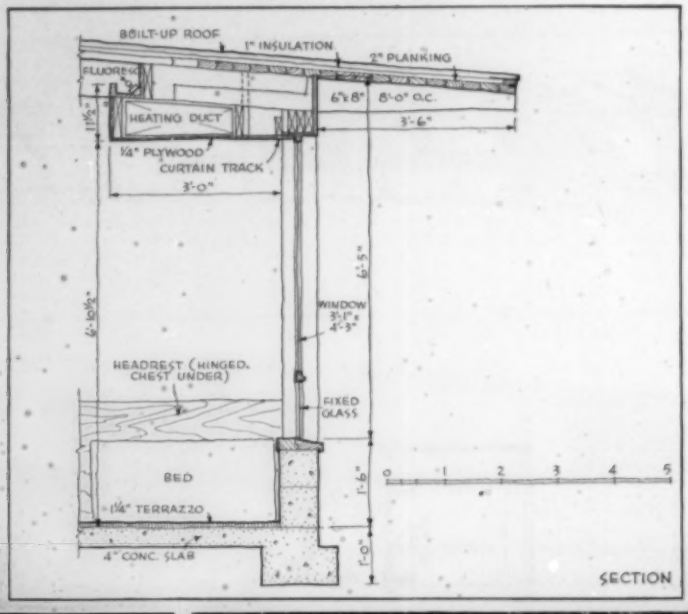




Structural system (upper drawing) is essentially mill construction with 6 by 8 posts and beams, and 2-in. planking roof covered with 1 in. insulation and built-up roofing. Interior columns, also 6 by 8's, run in the line of the bedroom walls; at the living room the system changes to 4 by 6 posts at the glass wall, with other interior posts at the closet. Though the site is an old Indian mound (see section) the land is low and ground water level high; thus house and pool were set at highest point. Not shown on the plan is a play yard for small children under the kitchen window, near boat landing. Under the kitchen at this point is a true garage, not for family cars, but for children's rolling stock. East wall of house is mostly glass, west wall is just insect screening. Masonry walls are all exposed concrete block

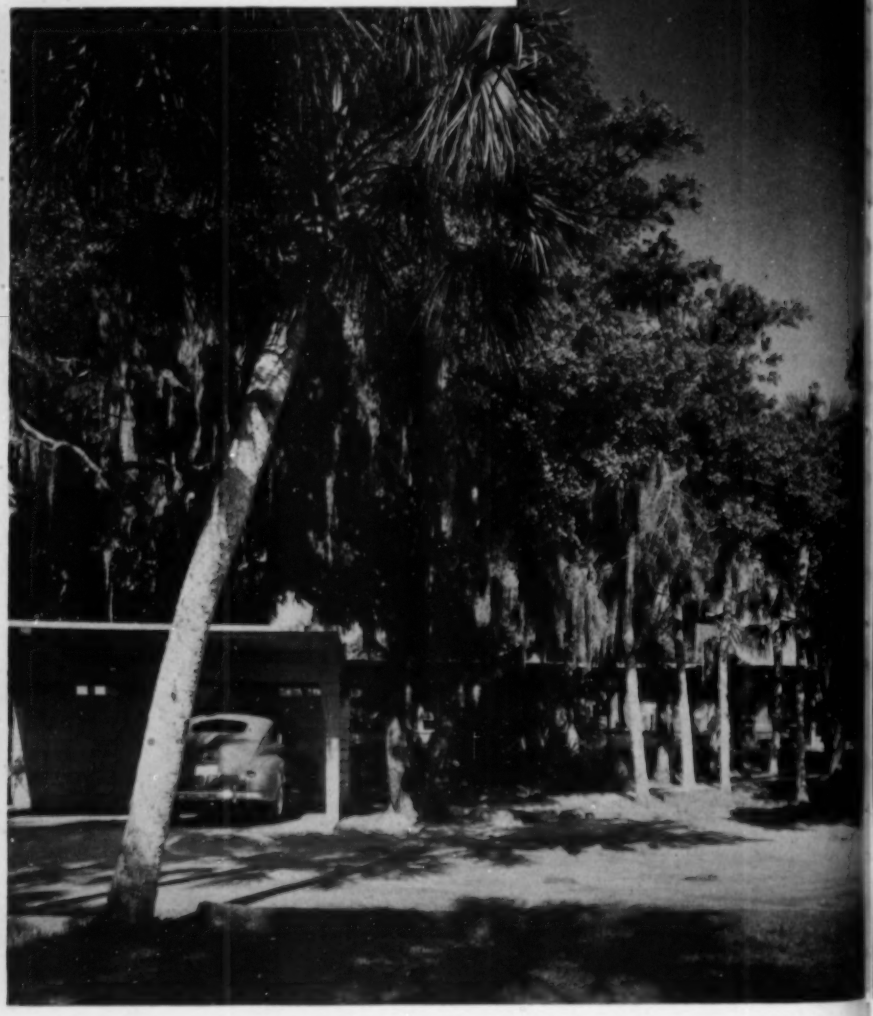
Ezra Stoller Photos



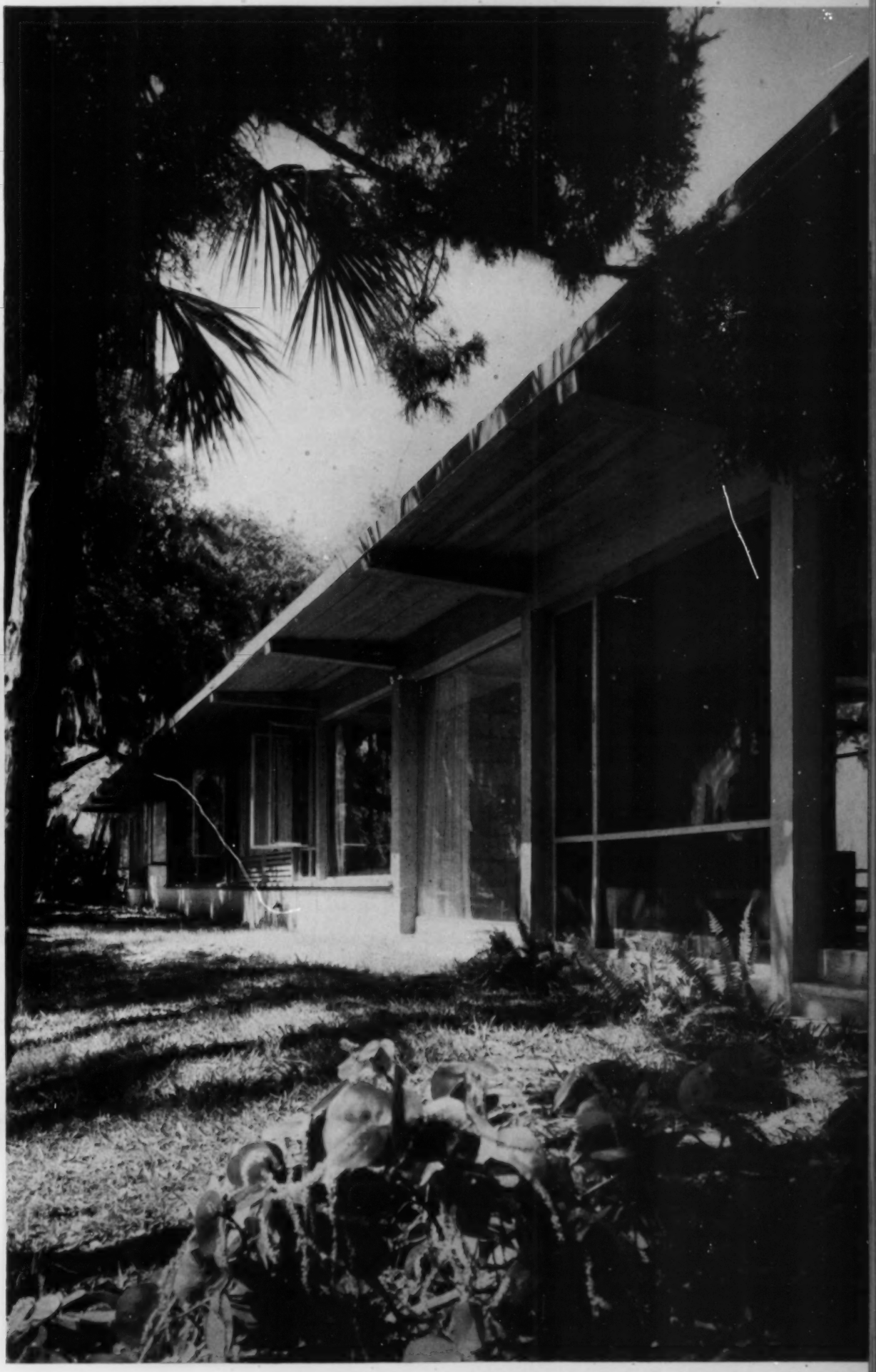


Joseph Janney Steinmetz Photos

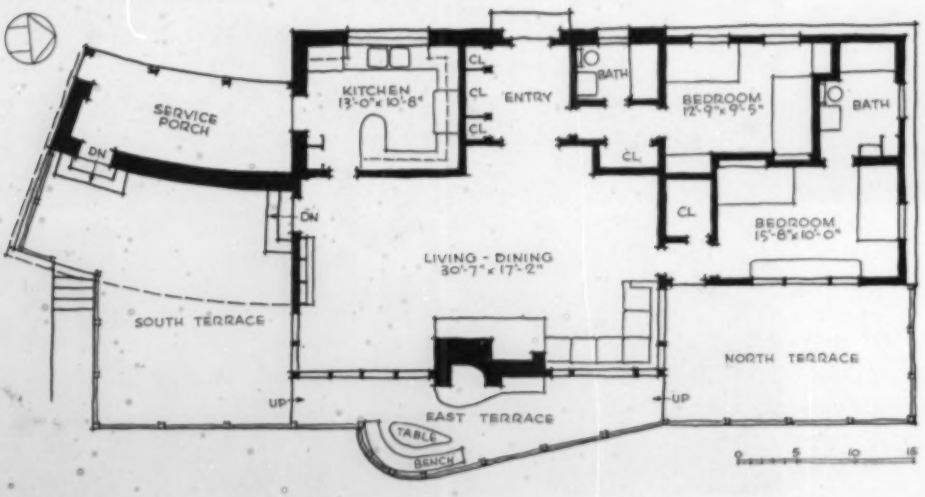
Ezra Stoller Photos



Heating is by forced warm air (see section above) with ducts in an enclosure at the ceiling which is also used for fluorescent lighting cove. Section is at study wall; note in section and in photo just below it the hinged headrest for beds, with chest for covers under headrest. Photo below, left, shows one of children's bedrooms; each child has built-in desk beside his bed. Center view shows east side of house, carport in foreground. Photo on opposite page shows same side, as seen from front entrance



Geoffrey Baker Photos



DESIGNED FOR VACATIONS

Hunting Lodge and Summer Cottage for Mrs. William P. Palmer, Jr.

Blue Hill, Maine

Louis Gelders, Architect

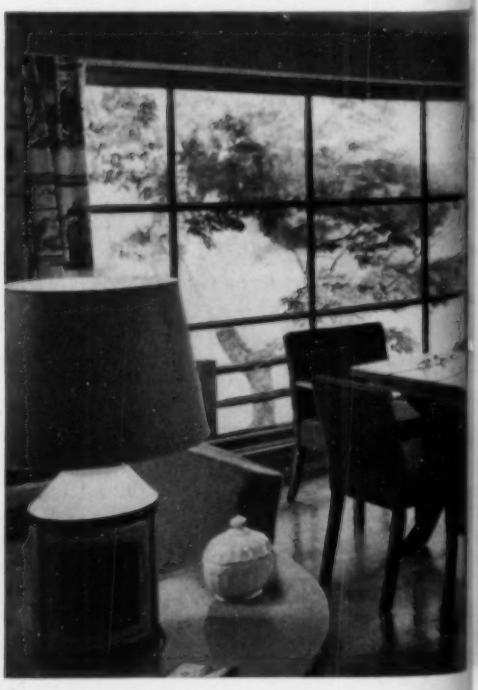
Rosemary Dudley, Inc., Decorator

ALTHOUGH intended primarily for vacation use, this Maine hunting lodge and summer home is a far cry from the casual rustic cabin of former years. Sturdily built, fully insulated and heated, it could serve equally well as a year-round residence. Rocky terrain, a magnificent view, a cool climate and the owner's requirement of ample provision for outdoor living were the chief factors influencing its design.

The site, as the photograph on the opposite page shows, is rocky and drops sharply to the water. The view is a wide one (see next page) across Blue Hill Bay to Mt. Desert. To blend in with the former, the house was given an exterior of native granite veneer of selected pink and beige, white pine flush siding stained a warm rose, white trim and a red cedar shingle roof. To take advantage of the latter and to fulfill the owner's outdoor living requirement, orientation toward the east was chosen, and three separate but connected terraces were ranged along the entire east side. The cool Maine climate dictated a sheltered south terrace and a plan which would make full use of the summer sun. In accordance with the owner's request, the combination living and dining room was made unusually spacious and the two bedrooms were held to an absolute minimum.

Although the house turns its back to the land (opposite page), its main entrance (right) is perforce on the land side. An unusually large service porch not only gives direct access to kitchen but also links road with south terrace and shore

Geoffrey Baker Photos



The huge living-dining room (right and across-page) has built-in book shelves and storage cabinets and windows on three sides as well as direct access to both north and south terraces. Each of the two bedrooms has its own bath, and closet space is unusually generous for a summer home.

Since the house is used in spring and fall as well as in summer, it is insulated with rock wool and has a forced warm air heating system. Floors throughout are cork tile; walls are plywood; ceilings, plaster. Terrace flagging is stone. The kitchen is all-electric.

Opposite

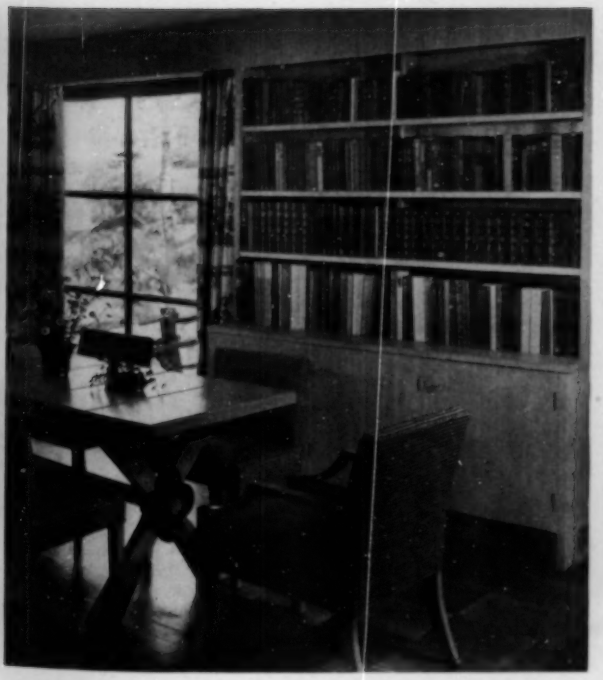
The large south terrace is well sheltered and offers direct access to the water

Right, above

The master bedroom faces the morning sun and has a superb view across Blue Hill Bay

Right, below

As befits a hunting lodge, build-in gun cabinets flank the archway between entry hall and living room



Haskell Photo

PLANNED FOR RESEARCH

Laboratories and Offices, National Research Corp., Cambridge, Mass.

Perry, Shaw and Hepburn, Architects

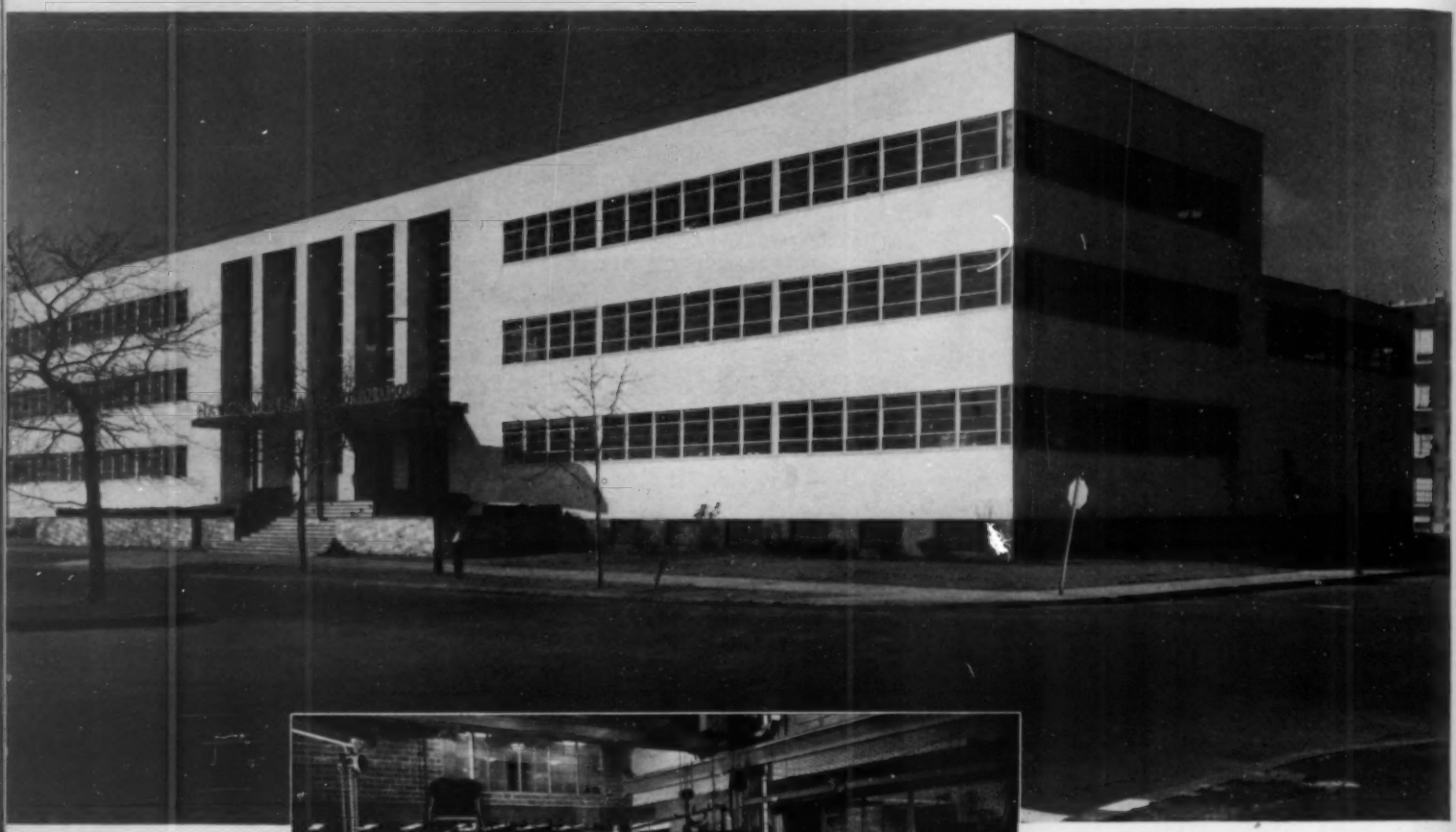
Haskell Photo

Paul Davis Photo

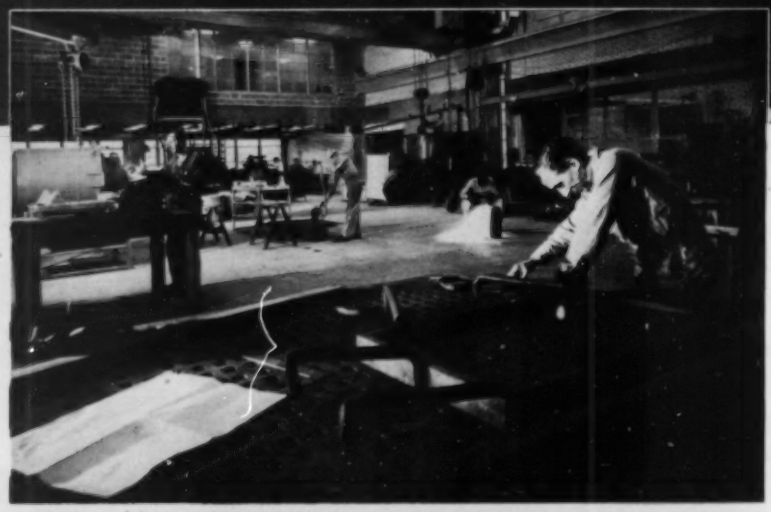
Analytical section of Chemistry Laboratory

A BUILDING designed specifically for industrial research can be expected to reflect certain intrinsically complex functional requirements. This laboratory building for the National Research Corporation, however, reflects certain other requirements as well.

The site of the building, in the first place, on Memorial Drive be-



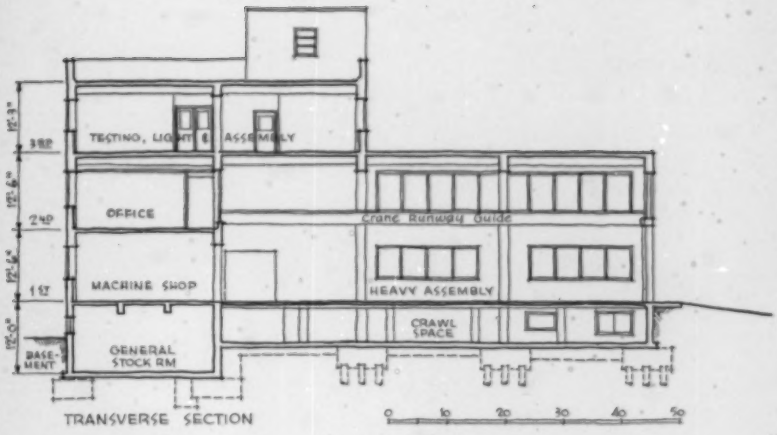
Haskell Photo



Welding and heavy assembly

Machine shop

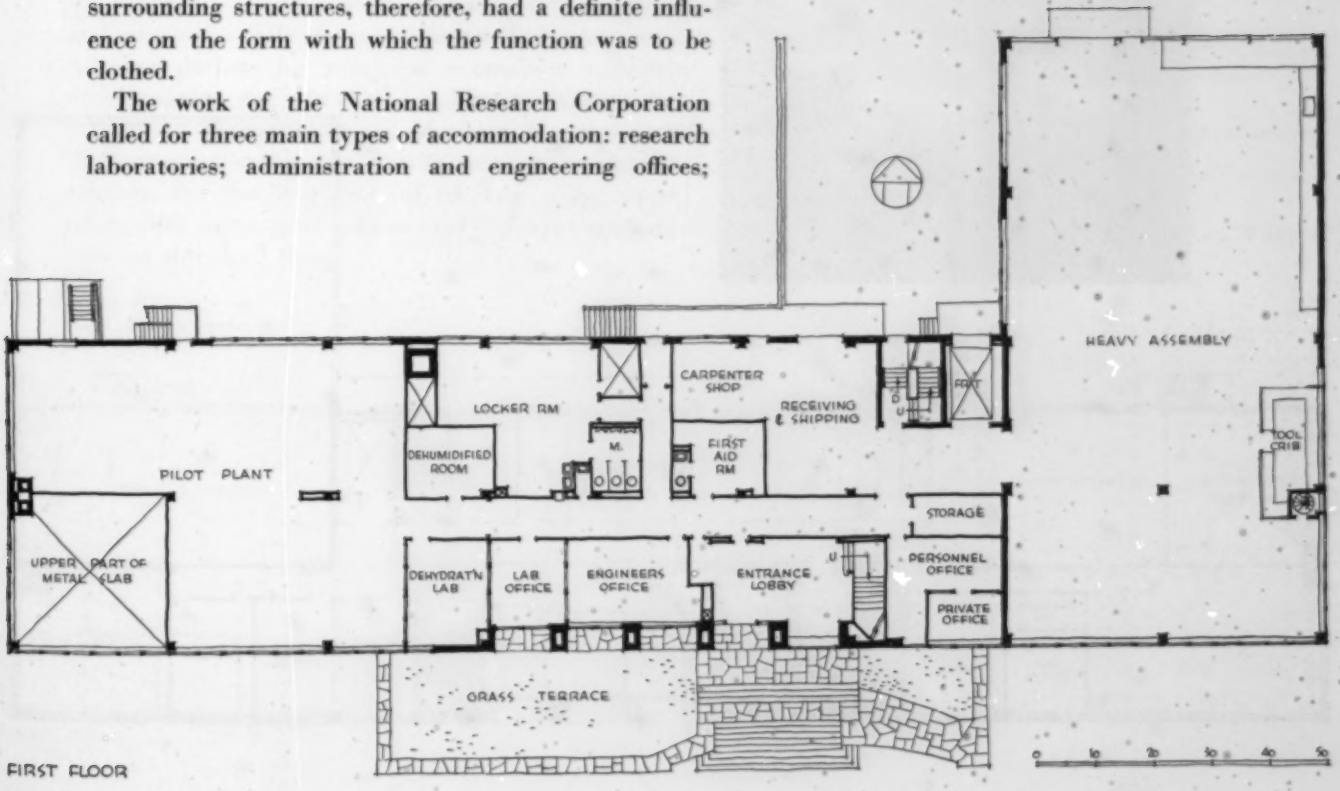
Paul Davis Photo



Framing of the building is steel, with exterior walls of brick. Offices in central portion are marked on front facade by broad pylons (opposite page). Building is planned for future expansion into a hollow square, completely enclosing the present lot

tween Massachusetts Institute of Technology and the Lever Brothers offices, was selected, the architects explain, because that portion of the Drive is known "as Research Row, on which is located one of the largest concentrations of research laboratories in the world." The appearance of the building, furthermore, was planned — again in the architects' words — so that it "would add prestige to the company and live up to the quality of the near-by buildings." Location and surrounding structures, therefore, had a definite influence on the form with which the function was to be clothed.

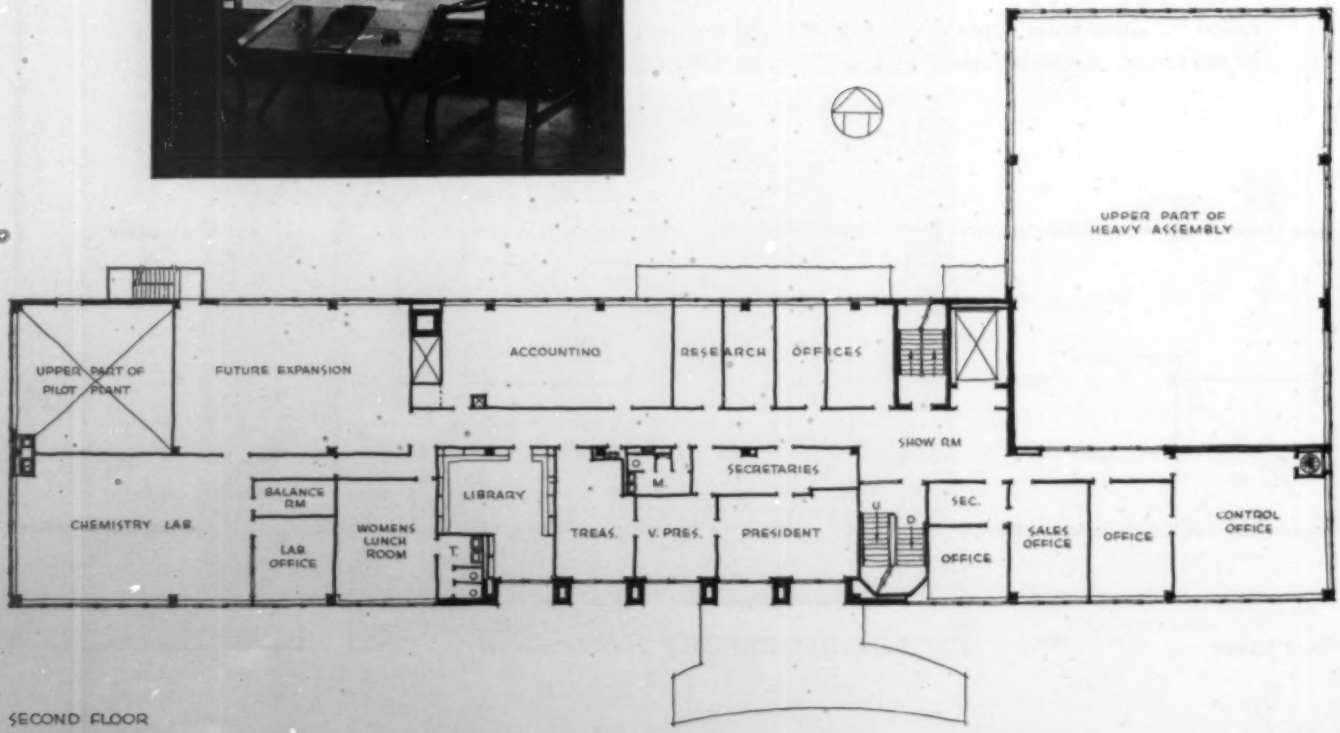
The work of the National Research Corporation called for three main types of accommodation: research laboratories; administration and engineering offices;



FIRST FLOOR

Haskell Photos

Lobby (above, left and opposite) is spacious and centrally placed; walls are linoleum-covered; lighting is fluorescent. Stairs lead directly to main offices on second and third floors



SECOND FLOOR

pilot plant and assembly manufacturing. Each of these specific but interdependent functions was allocated a separate portion of the building. Research laboratories, starting with heat treatment and metal furnaces in the basement and progressing upward through physics and chemistry laboratories, occupy the west wing. Accommodations for personnel executives, executive and designing engineers' offices, library, drafting and accounting departments are provided in the center. The heavy assembly plant and machine shop combined take up the first two floors of the east wing, topped off by the supervisors' offices and the light assembly area on the third floor.

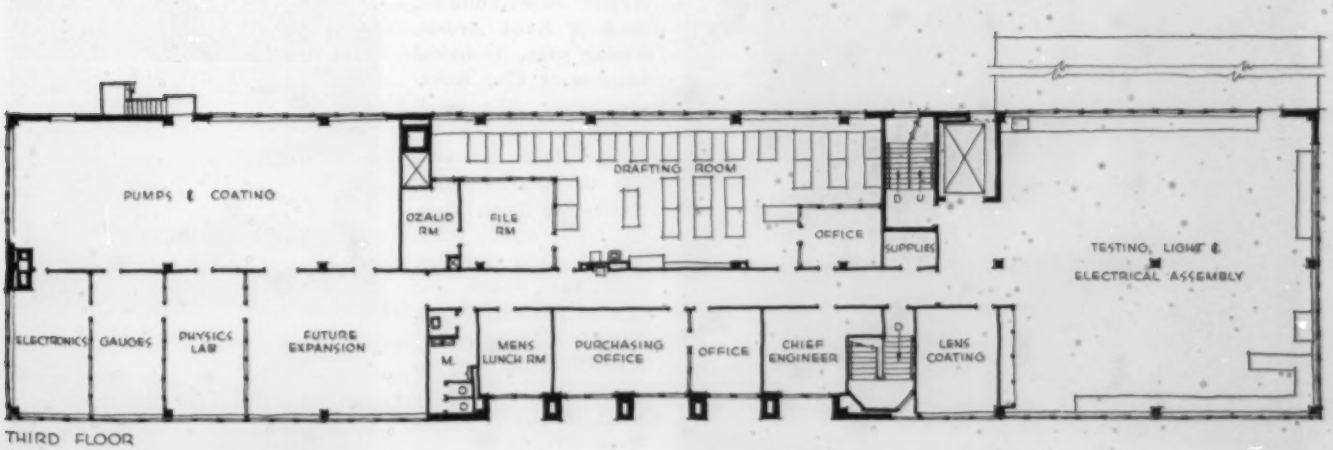
Beacon Piping Co., Heating and Process Piping

P. J. Riley & Co., Plumbing

Lord Electric Co., Inc., Electric Work

Jackson & Moreland, Structural and Mechanical Engineers

Thomas O'Connor Co., Builders



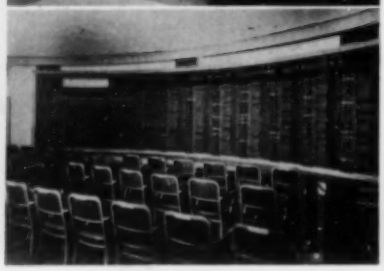
THIRD FLOOR

SMALL BUSINESS BUILDINGS

Frederic Arden Pawley, Architect

The RECORD has published annually many studies of tall office buildings.* This year we decided to examine smaller types of more general interest to architectural offices located outside major metropolitan areas. Potential volume of new buildings for the country as a whole will be greater in this class of structure in the multi-story class. Six stories, through an arbitrary limit, seem appropriate and the range downward includes the one-story taxpayer.

OCCUPANCY types vary enormously in general-purpose buildings. There are few design and planning factors common to them all. The appended bibliography shows an extensive literature on office-planning space standards which will be reviewed briefly herein. Perhaps this intrinsic variety suggests a primary design principle — flexibility is mandatory. Ground floor space will usually house retail, showroom or other occupancies requiring easy public access. Rear areas may possibly provide public commercial recreation or entertainment facilities. Each of these is regularly treated as a sub-



Left, Remington-Rand Bldg., Philadelphia; Thalheimer & Weitz, Archts.; C. V. D. Hubbard photo. Above, American Home Bldg., Queens, N. Y. (S. Minskoff, owner-builder), Boak & Raad, Archts. Facing page, Technical Instrument Co., Houston, Tex.; Mackie & Kamrath, Archts.; Mears Studio photo. Interiors, top to bottom: office, Remington-Rand, Dallas, Tex., G. L. Dahl, Archt.; own drafting room, Page, Southerland & Page, Archts., Austin, Tex.; board room, Merrill Lynch, Pierce, Fenner & Beane, Orlando, Fla., James Gamble Rogers III, Archt.

*(*See Bibliography references: 44-51)*

ject for a Building Types Study in itself. Consequently, in this article, emphasis will be on the building as a whole.

The architect must coordinate, in a commercial building project, many correlative and often divergent points of view. To sell his own services he must be acquainted with preliminary and operating procedures. To this end we have consulted experienced real estate men, lenders of construction and permanent funds, building managers, maintenance experts and corporations who are tenants with national experience in leasing office space. They have generously contributed data for the following pages.

It is equally important for these factors in the building industry to understand the architect's point of view and to recognize the financial as well as esthetic benefits of his function of comprehensive coordination. The essential fact is that commercial buildings are not well designed unless they are continuously profitable.

This ideal result, a continuously profitable building, is a complex product of intelligence applied to the following problems:

PROBLEMS:			ARCHITECT PLUS
location	rentable areas (including shapes)		owner
climate	flexibility		financier
orientation	services & equipment		realtor
local conditions & regulations	fenestration	STUDIED BY	consultants
site selection	materials & workmanship		contractors & labor
parking	types of occupancy		code officials
plot size & shape	construction costs		insurance organizations
height	management, personnel & operating costs		tenants
structure	financing		operating staff

A successful commercial building project, perhaps more than any other building type, implies the solution of a giant equation including all the above-tabulated known, unknown and variable factors. Accurate resolution of all these contributory forces into a structure meeting the needs of its population, owners and community — including esthetic needs — is the especial function of the architect. To perform this function properly he must be retained at the beginning of the project and to be of most use at this stage he must know a few fundamentals of real estate, finance and insurance practice.

SMALL BUSINESS BUILDINGS

Finance and Real Estate Viewpoint

Rental return or income from a proposed building, usually measured in dollars per square foot of rental space, is naturally a primary concern of lenders and real estate managers. Type, area and cube of building are studied by them in preliminary financial set-ups devised to show a profit above an adequate income to defray costs of financing, construction, taxes, depreciation and operation and to arrive at a reasonable rent per square foot. Decision on whether a project goes ahead must be based on such "adequacy of improvement."

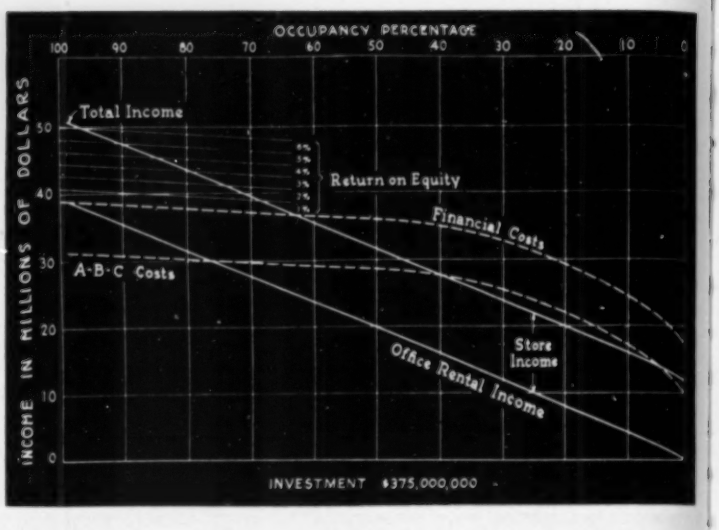
Preservation of income in bad times is more difficult in some types of buildings than in others. Experience has shown need for flexibility of space arrangement (and for ease of re-subdivision, particularly into smaller units) to provide for changes in tenancy. Low operation and maintenance costs are essential. It is second nature (or perhaps first) for a building manager to consider "eventual tenants" more than original or current occupants. This influences managerial attitudes toward tenant alteration practices, approvals and expenditures, even in the cases where alterations are paid for by the tenant.

Kind of occupancy for specific buildings affects lenders' viewpoint. Even a 20 to 25 ft retail frontage can secure an adequate institutional loan provided the tenant can develop the required income from the property. It would be impossible space for a variety chain store but quite acceptable for a specialty shop with concentrated selling of high-margin-of-profit goods. A 50 ft six-story building may be an unsound investment in bad times. Major tenants may move out leaving larger spaces which are expensive to alter for small tenants. Rents will be lower due to competition, particularly those paid by such smaller tenants because they can move easily. Increased partitioning reduces rentable area (additional non-revenue corridor, etc., required). Operating costs increase with number of tenants and even if parts of building are closed off there may be spotty tenancy requiring uneconomic service for partly vacant areas. Under depressed conditions managers often cannot afford to maintain premises as well as in normal times; and a building which, because of poor plan, materials or equipment, is difficult (i.e. expensive) to maintain, will be neglected. Rents obtainable from a shabby building are depressed and the situation becomes a pernicious downward spiral of blight.

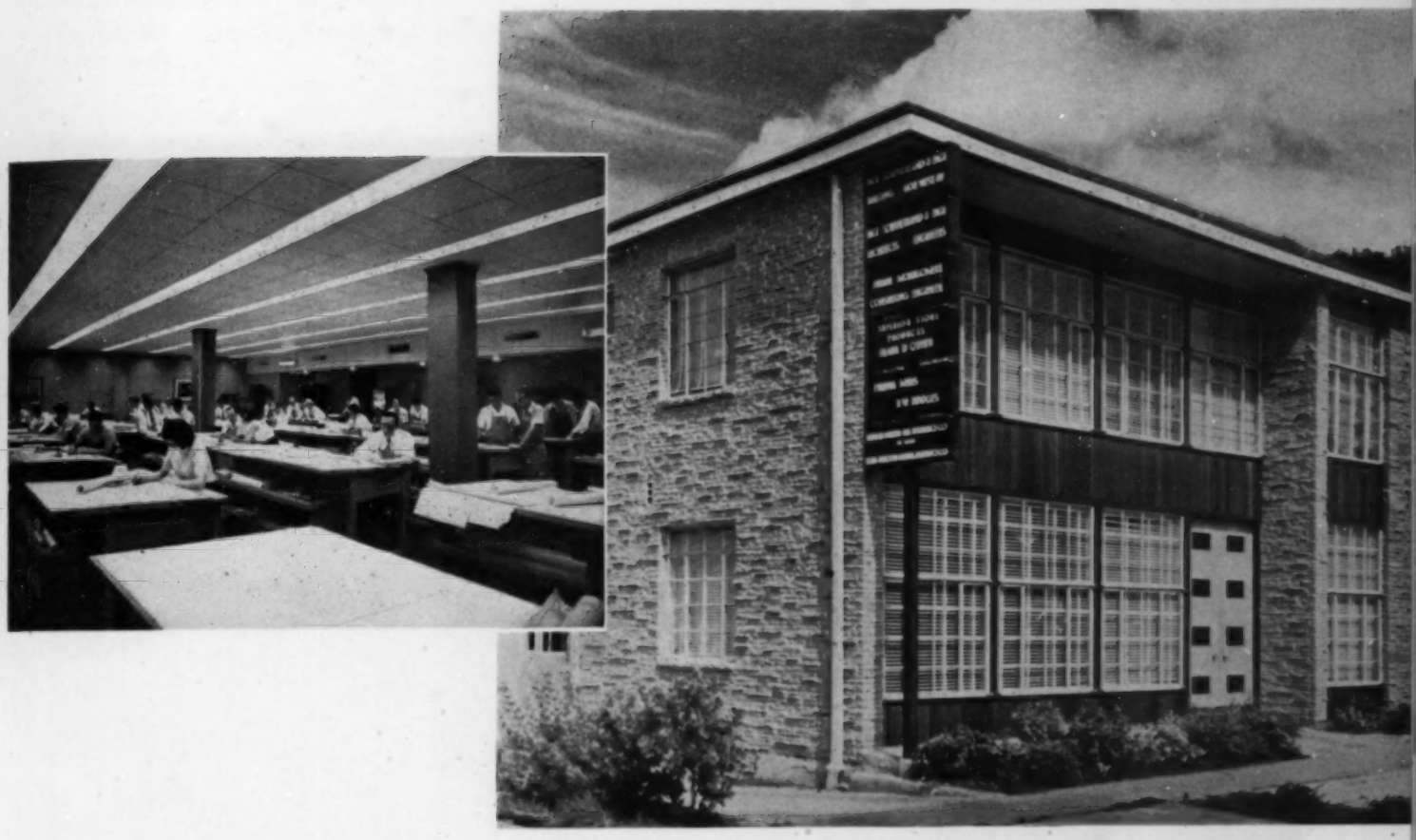
Multi-occupancy is by some authorities considered not as desirable as larger unit leases. Professional offices, doctors, dentists, etc., although traffic producers profitable for some locations, create special problems such as increased operating expenses and maintenance (special utilities) and baby-carriage parking!

On the other hand, a New York City savings bank president, whose mortgage department made more loans in August 1949 than any other lender reported for that month, points out that higher rents can be obtained from small offices. They may be priced on a unit basis rather than on the square-foot basis used for larger space. As an example he compared one floor bringing $10,000, rented as a whole, with another floor of same area in same building which brought $14,000, rented as many small offices.

The architect may be in the position of establishing floor development plans for buildings before rental and he must balance such differing viewpoints against local demand.



This graph illustrates how quickly most buildings would begin to lose money at present rental rates were their occupancy to drop sharply. It was prepared by the National Association of Building Owners and Managers (111), and is based upon a spotcheck survey of rental incomes and operating expenses for more than 100 buildings at the end of the year 1947. Net income disappears at about 65% occupancy, and is only about 5% at 90% occupancy. "A-B-C costs" are three categories of operating and fixed costs periodically reported to the N.A.B.O.M. by members throughout the country



Left: Deep space—controlled conditions: *air, light, sound, for efficient operation. George L. Dahl, Architects & Engineers, Dallas, Texas*
Right: Multi-occupancy: *Architects, consulting engineers, manufacturers' sales offices, insurance agency. Page, Southerland & Page, Architects & Engineers, Austin, Texas. Photo: Studtman Photo Service*

The usability of upper-floor rental space for a variety of occupancies is often a matter of depth of space from window walls to corridors. Some tenants, such as insurance offices or others with large clerical, filing and storage requirements, may need deep space. Lathrop Douglas, A.I.A., has pointed out in an excellent article (45) a number of office-planning fallacies and showed the actual economies of furnishing air conditioning, superior lighting, acoustic treatment, etc., to provide Class A space anywhere in a building. The old rule of no space deeper than 27 ft from a window wall and the real estate aphorism that "people want to buy windows" is less true from a technological viewpoint in such conditioned space. It still holds from a psychological viewpoint, however, especially where large-area leases are not concerned. This will be referred to again under planning.

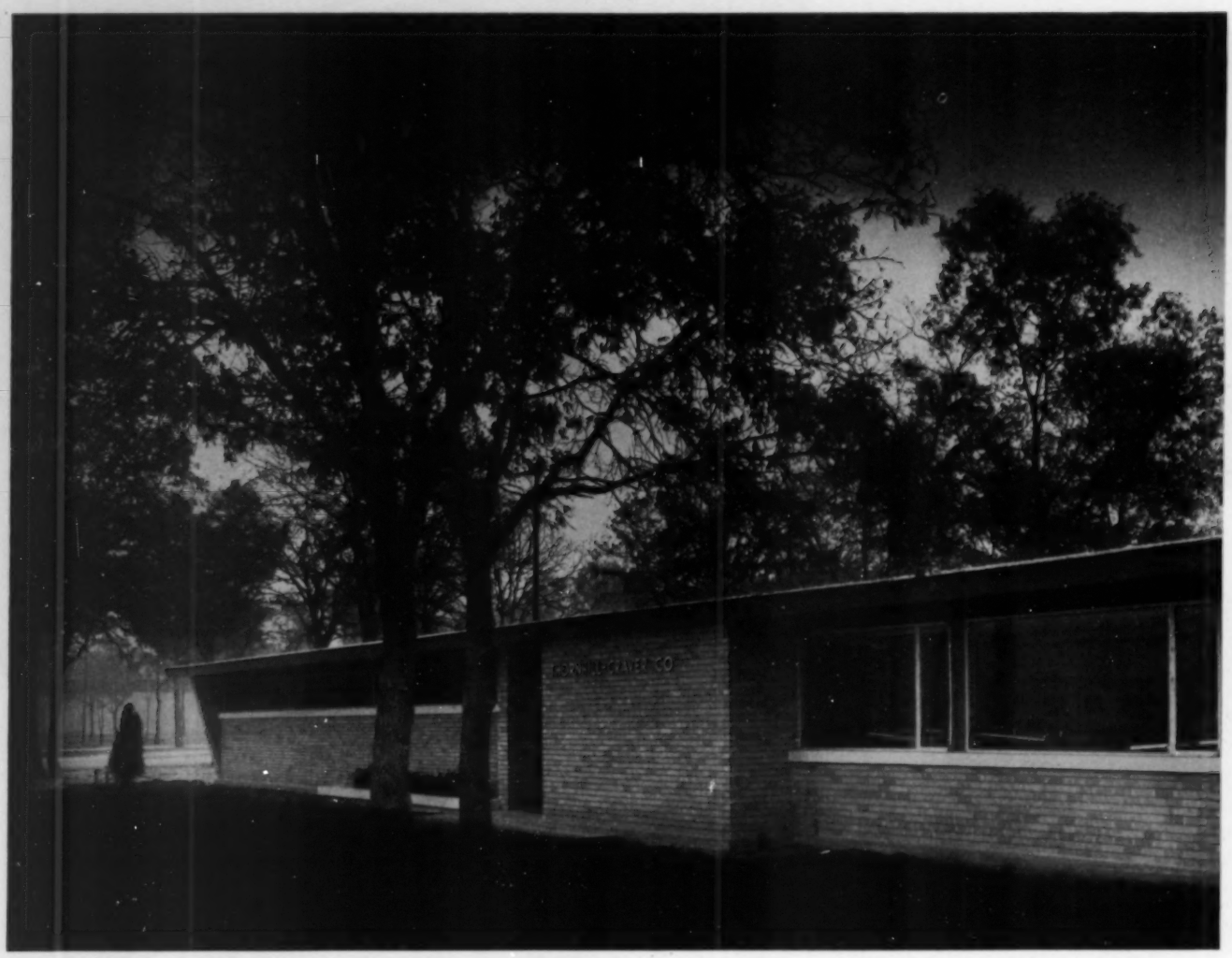
There are other amenities which increase the desirability of a building for tenants and which will act to preserve income in competitive periods. Adequate nearby parking facilities are extremely important. A decentralized location, if appropriate for proposed occupancy, may bring other attractive advantages of light, air, space, landscaping and less expensive land.

Certain tenants will welcome provision of facilities for joint use: conference rooms, telephone answering service and low-cost storage areas in basement. The latter recommendation is based on current policies of record retention. There is no reason why a tenant should pay premium rents for inactive file and storage space and in competitive times the smaller tenant cannot afford to do so.

An attractive, convenient entrance, lobby and public spaces will also help to hold tenants. Tortuous access

SMALL BUSINESS BUILDINGS

Finance and Real Estate Viewpoint



Decentralized offices

Thornhill-Craver Co., Houston, Texas, Mackie & Kamrath, Architects. Photo: Mears Studio

Lobbies and public spaces

Left: Citizens' National Trust & Saving Bank, Los Angeles, Stiles Clements Associates, Architects. Photo: Shulman. Right: Costello Bldg., Los Angeles, McFarland & Bonsall, Architects. Photo: Knowles

Conference rooms

Top photo: Own offices. Page, Southerland & Page, Architects. Photo: Studtman Photo Service Lower two photos: Esso Headquarters, Richmond, Va. Carneal & Johnston, Architects. Photo: Dements' Studio

to offices makes a poor impression and often indicates wasteful use of space. The ratio of rentable area to total building area possible to develop on the plot, particularly on high-cost land, must be watched in planning a building for profit. If a building develops vacancies when exit, elevator and service area is excessive this factor alone may alter financial relationships sufficiently to cause distress.

Some operative builders and experienced building owners develop tenants and secure commitments from them before breaking ground for a new building. Lenders naturally prefer this situation; money is more easily available if at least one strong tenant is signed up. Favorable terms of financing will depend largely on the location of the project in relation to the business district and the demand for its proposed occupancy. No hesitation is usually found on loans for projects in a 100% business district since resale is rarely difficult. One insurance company making "building and permanent" loans currently quotes 3½% to 4% interest on one or two-story buildings in 100% districts with short term leases. In an 80% district the interest rate would be 4¼% to 4½% and longer term leases would be required (10 to 20 years maximum, permitting determination of and adjustment to district trends). To these rates must be added amortization of 1% to 3% per year. A popular method is the constant payment plan whereby the proportions of payments on principal and interest vary as the principal is reduced.

Determination of rental rates

In office building financial analyses a vacancy allowance is now normally set at 10%. A postwar article on Philadelphia conditions (11) pointed out that that city had had an average vacancy of 18% for 25 years previous to the war. Averaging this with 5 years of 100% occupancy the author recommended use of a 15% allowance. Actual 1949 Manhattan vacancy is about 2%. These figures are given to show that local conditions must govern such estimating allowances.

Entrance establishes character

Left: Sill Bldg., Bakersfield, Calif., Kump & Falk, Architects. Photo: Roger Sturtevant. Center: Costello Bldg., Los Angeles, McFarland & Bonsall, Architects. Photo: Ralph E. Knowles. Right: Remington-Rand Bldg., Phila., Thalheimer & Weitz, Architects. Photo: Hubbard

SMALL BUSINESS BUILDINGS

Finance and Real Estate Viewpoint

Sixty per cent is the normal operating ratio for tall office buildings (based on total rental areas — operating ratios based on rentable office areas were 75% for 1947 and 72.7% for 1948) (7). This means that 60% of total income is normally required for operating expenses. Sixty per cent of operating expenses is required for labor, not including management, with little hope of reducton. It is concluded, therefore, that any substantial improvements in operating ratio must come through increases in rental rates.

An editorial by Charles A. McCaleb of *Buildings & Building Management* (15) says in part: "Devised originally as a measuring stick to aid building operators in comparing operating costs, the square-foot unit soon found its way into renting, when renting men discovered that it provided a quick and easy means of obscuring physical differences between good offices and bad in comparing competitive offerings."

The Sheridan-Karkow rental rate formula (explained on page 102) is derived by reference to a standard unit office 18 x 25 ft (deep) facing street frontage of building on the 8th floor. Since its formulation a number of refinements have been proposed. These are reviewed by B. L. Lefler (17) who points out that there are difficulties in applying such criteria rigidly because space variables are not fixed. Technological changes with increased use of air conditioning and better lighting have improved deep space. Tenants with more than 5000 sf may need considerable deep space. The variety of tenant installations makes great differences in maintenance and service. Doctors and dentists cost more than large fire insurance agencies. Small tenants generally cost more than large ones and shallow space more than deep. A plan with many private offices increases costs. Small law firms cost more than average business tenants.

COMPANY BRANCH OFFICES IN

Firms with 100–200 branch offices throughout the country vary in leasing and location requirements. One prefers 10-year maximum leases near but not in the 100% districts. A competitor wants 5-year maximum leases, preserving more mobility for offices similarly located, and may move to get into a better market area or away from an expensive location or to provide for expansion. One insurance company insists on 5-year maximum leases although its average tenancy has been about 20 years for hundreds of offices. Length of lease has direct effect on extent of alterations and make-ready expenses tenant is willing to assume.

An architect may become vitally interested in such details of loans and leases if he is retained at the outset of a project or if he becomes architect or consultant for a company with a multi-branch office organization

26	Acme Steel Co.
14	Ahlberg Bearing Co.
27	Airetool Mfg. Co.
62	Air Reduction Sales Co.
27	Ajax Flexible Coupling Co.
23	Aldrich Pump Co.
20	Allegheny Ludlum Steel Corp.
16	Allen-Bradley Co.
59	Allied Chemical & Dye Corp.
99	Allis-Chalmers Mfg. Co.
54	Aluminum Company of America
14	Aluminum Cooking Utensil Co.
27	American Brass Co.
26	American Cabinet Hardware Co.
65	American Chain & Cable Co., Inc.
25	American Cyanamid Co.
13	American Emblem Co.
21	American La-France Foamite Corp.
15	American Manganese Steel Div. American Brake Shoe
19	American Mineral Spirits Co.
15	American Nickeloid Co.
264	American Optical Company
21	American Phenolic Corp.
10	American Tobacco Co.
32	Anchor-Hocking Glass Corp.
41	Anchor Post Fence Div., Anchor Post Products Co.
26	Armco Steel Corp.
39	Armstrong Cork Co.
26	Atlas Powder Corp.
48	Automatic Sprinkler Corp. of America
18	Automatic Temperature Control Co., Inc.
39	Babcock & Wilcox Co.
18	Bailey Meter Co.
15	Bemis Bros. Bag Co.
13	Bentley-Harris Mfg. Co.
37	Bethlehem Steel Corp.
17	Binks Mfg. Co.
15	Black Mfg. Co.
41	Black, Sivalls & Bryson, Inc.
32	Blackmer Pump Co.
22	Bowser, Inc.
14	Bridgeport Brass Co.
15	Brockway Glass Co., Inc.
14	Brown-Brockmeyer Co.
29	Brown Instrument Co.
15	Charles Bruning Co., Inc.
22	Buckeye Tools Corp.
26	Bull Co.
9	Carboloy Co., Inc.
14	Philip Carey Mfg. Co.
34	Carnegie-Illinois Steel Co.
19	Carrier Corp.
15	Celotex Corp.
25	Chain Belt Co.
16	Chapman Valve Mfg. Co.
24	Chicago Pneumatic Tool Co.
18	Cincinnati Electric Tool Co.
20	Clark Equipment Co.
18	Clary Multiplier Corp.

Another formula approach (18) to pricing office space, which can be applied also to modernization projects, is more arithmetic than criteria:

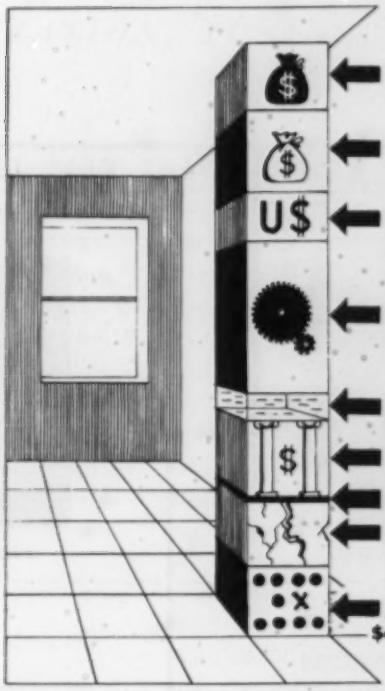
$$\text{Average rental psf} = \frac{\text{Capital investment} \times \text{Interest return desired}}{\text{Total rental area} \times \text{Retainable profit from rental dollar (= \% oper. profit)}}$$

EXAMPLE:

Assume:

Capital investment	$1,000,000.
Interest return desired	.06
Total rentable area	50,000 sf
Retainable profit (from each dollar of rent)	.03

$$\text{Avg Rental rate} \quad \frac{1{,}000{,}000 \times .06}{50{,}000 \times .03} = \frac{60{,}000}{15{,}000} = \$4.00 \text{ psf}$$



.530	50% mtge. int. @ 4%
.662	Equity capital return on 50% investment @ 5%
.406	Federal income tax reserve to provide 5% ret. on eq. cap.
1.598	Total financial burden on investment return requ'm'ts
1.317	Operating costs
.200	Air cond. oper. & maint.
1.517	Total operating costs
.663	Property taxes, 50% valuation @ $5.00
.032	Insurance
.562	Depreciation; 2½% on bldg. cost
1.257	Total fixed charges
4.372	Rental rate, 100% occupancy
.486	Adjustment for 10% vacancy
$4.858 PSF	Rental rate 90% occupancy

Wayne Colvin

THE UNITED STATES

Approximate totals including major subsidiaries and divisions. Agents, sales representatives, etc., omitted.

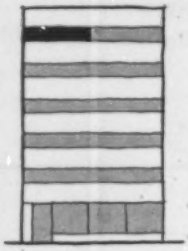
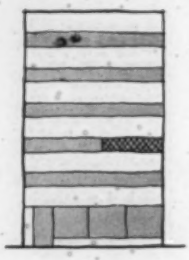
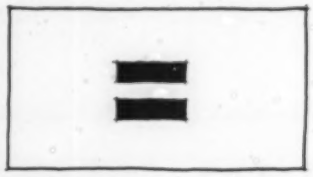
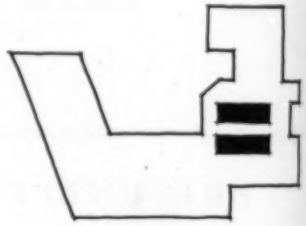
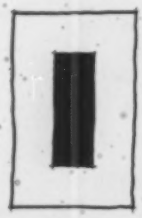
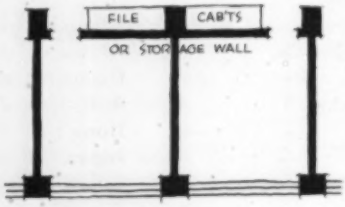
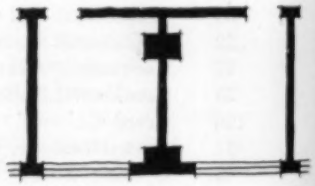
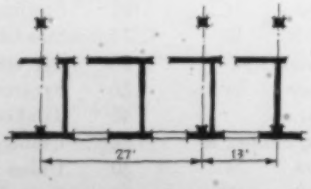
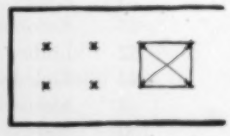
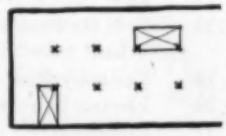
38	Cochrane Corp.
28	Colson Corp.
15	Commercial Solvents Corp.
54	Continental Can Co., Inc.
22	Continental-Diamond Fibre Co.
17	Continental Electric Co.
25	Continental Rubber Works
126	Crane Co.
31	Cutler-Hammer, Inc.
43	Cyclone Fence Div. American Steel & Wire Co.
16	Deere & Co.
44	Diamond Alkali Co.
19	Diamond Mfg. Co.
21	Dings Magnetic Separator Co.
18	Dodge Mfg. Corp.
12	Dow Chemical Co.
134	E. I. Du Pont de Nemours & Co., Inc.
16	Economy Fuse & Mfg. Co.
19	Electric Storage Battery Co.
21	Elliott Co.
28	Erie City Iron Works
20	Exact Weight Scale Co.
18	Fafnir Bearing Co.
38	Fairbanks-Morse & Co.
30	Federal Electric Products Co.
18	Federal Products Co.
25	Federated Metals Div. American Smelting & Refining Co.
28	Fibre Specialty Mfg. Co.
14	Flintkote Co.
28	Foxboro Corp.
223	General Electric
29	B. F. Goodrich Co.
98	Graybar Electric Co., Inc.
24	Hercules Powder Co., Inc.
31	Homelite Corp.
24	A. C. Horn Co., Inc.
18	Howe Scale Co.
34	Ingersoll-Rand Co.
46	Inland Steel
70	Interchemical Corp.
200	International Business Machines
84	International Harvester Co.
18	Bryon Jackson Co.
28	D. O. James Gear Mfg. Co.
55	Johns-Manville Corp.
23	Kelley-Koett Mfg. Co.
28	Kennametal, Inc.
22	Libbey-Owens-Ford Glass Co.
40	Link-Belt Co.
48	Liquid Carbonic Corp.
100	Merrill Lynch, Pierce, Fenner & Beane
1000	Metropolitan Life Insurance Co.
64	Minneapolis-Honeywell Regulator Co.
20	Monsanto Chemical Co.
28	Mueller Brass Co.
51	National Cylinder Gas Co.
28	National Steel Corp.
19	National Vulcanized Fibre Co.
21	Okonite Co.
35	Oliver Corp.
20	Oliver Iron & Steel Corp.
268	Otis Elevator Co.
26	Owens-Corning Fiberglas Corp.
22	Permanente Metals Corp.
11	Pittsburgh Plate Glass Co.
1200	Prudential Insurance Co.
200	Remington Rand
48	Republic Steel Corp.
37	Revere Copper & Brass Co.
42	Reynolds Metals Co.
19	Rheem Mfg. Co.
16	Scovill Mfg. Co.
37	Signode Steel Strapping Co.
74	Simplex Time Recorder Co.
46	Square D Co.
21	Sterling Electric Motors, Inc.
37	Sun Chemical Corp.
18	Sylvania Electric Products, Inc.
26	Syntron Co.
42	Timken Roller Bearing Co.
82	Union Carbide & Carbon Corp.
30	Union Iron Works
36	United States Rubber Co.
135	United States Steel Corp.
48	West Disinfecting Co.
263	Westinghouse Electric Corp.
28	Wheelco Instruments Co.
42	Worthington Pump & Machinery Corp.
22	Wyckoff Steel Co.
41	York Corp.

SMALL BUSINESS BUILDINGS

Finance and Real Estate Viewpoint

One rather elaborate attempt to arrive at fair rent for office space is known as the Sheridan-Karkow formula. Its interest to architects is not in results for any particular case but in the criteria it sets up to define good space from user's point of view. Diagrams and photos compare criteria of this nature.

FACTORS WHICH AFFECT REAL ESTATE VALUE

MORE DESIRABLE	LESS DESIRABLE	MORE DESIRABLE	LESS DESIRABLE
CORNER OFFICE	ONE-WALL	SUN CONTROL	GLARE
 UPPER FLOOR	 LOWER	 REGULAR SPACE	 IRREGULAR
 SHALLOW SPACE	DEEP	 GOOD COL. LOCATION	 AWKWARD
STANDARD SPAN	 NON-STANDARD	 FREE SPACE	 CROWDED
CLEAR VIEW OUT	ROOF OR OBSTRUCTED VIEW	BIG WINDOWS	SMALL

LOCATION FACTORS:

DECENTRALIZATION, ZONING, PARKING

Decentralization has resulted in an increase of office building construction in smaller cities. Reasons are various; defensive dispersal is only one. The financial advantage which may determine whether manufacturing administrative offices should be located at a plant or in an office building is only the difference between the capitalization of the two projects. The operating expenses and taxes will be approximately the same and contemporary communication facilities avoid most inconveniences due to separation. A recent article by a life insurance official (9) points out several reasons for reduction of new general office building construction in central areas:

(1) Industrial office space (at plants)
(2) "Home of their own" tendency
(3) Medical arts buildings
(4) Decentralization of merchandising

Lower interest rates are available to large organizations with national credit such as telephone and oil companies. This permits them to pay off on new construction years before private owners and consequently "high building costs alone will not stop new office building where large space users feel they need it." (9) An insurance or other sales branch office should be located to serve its territory with least travel by salesmen. This results in a two-sided location concept — *decentralization* of company as a whole and *centralization* of branch in its territory. Often no particular survey methods are used. Variety and food chains and other public-access services are usually established first and define a neighborhood or suburban shopping center based on their own careful surveys. "Many large companies make and keep current such studies on communities in a number of cities in which the location of a store might be desirable in the future. . . . No population center remains constant. Whatever type of area is selected for a store, it is important to select one that is not declining — and it is preferable to select one that is growing now and will continue to do so. . . . A market area is a dynamic thing, constantly adjusting to the economic and social forces which determine its pattern. . . . A good location of today may, in a few years, become a poor one." (33)

Real estate analysis or appraisal techniques for retail or office building sites include preparation of occupancy or strip maps showing location of all business and other occupancies in a city district. Realtors who specialize in chain-store locations prepare these for many cities as a basis for site selection in that highly competitive market.

Cities with "pin-wheel" or radial access highways often lack adequate circumferential connections. For satisfactory office building sites, a city plan should have what one location executive calls "criss-cross" transportation. The usual unplanned suburban development lacks these crossways and building locations remote from main intersections or "hubs" will not properly serve the area. Insurance offices must consider ease of access to parking, transit, post office and banks. Security and commodity brokerage offices must be in financial districts, near banks, unless they are local branches decentralized for some special area near a concentration of customers. "It is preferable to be situated as closely as possible to organizations with which the greatest volume of business is done." (38)

"It has become evident that there is no dependable relationship between the quantity of pedestrian traffic and the value of a site as measured by retail sales. The Bureau of Foreign & Domestic Commerce made a study of traffic-trade relationships for drug stores and concluded that traffic volume when unrelated to character of the traffic is an unreliable measure of potential business of a site. . . . Corners having the heaviest traffic are not always the best business addresses . . . frequently traffic is too congested. . . ." (33) "The value of an office location from the standpoint of advertisement cannot be overlooked. It may be financially impossible to secure comparable advertising value through other mediums." (38)

"Vacant buildings are regarded as bad neighbors, thus vacancies nearby should be carefully investigated. It is possible that the buildings are old and untenantable. On the other hand, perhaps a small amount of face-lifting on several old buildings for which the rent is relatively low would improve the entire block. One store might be able to start a low-cost but very effective renovating program, to the advantage of a group of stores. . . . A great deal can be learned from studying the occupancy history of the site under consideration." (33)

Zoning: A review of existing and proposed zoning regulations throughout the country indicates a definite trend toward mixed use. A number of cities for years have permitted retail and service shops on ground floors of multi-family dwellings. Progressive zoning proposals indicate still more intimate relationships between residence and employment. These may be effected by increased residential use of space above commercial occupancies in closely-built districts and by offices and very light or precision manufacturing in residential areas, with attractive lawns and landscaping. Offices and laboratories are already found in some low-

Location Factors

Below left: Brokerage office attached to bank building. Merrill Lynch, Pierce, Fenner & Beane; Phoenix, Arizona; Lescher & Mahoney, Architects
Below: Good design is best advertising. Sill Bldg., Bakersfield, Cal.; Kump & Falk, Architects

Left: Great Southwest Photography (Olchvaryl. Above: Roger Sturtevant

density residential areas and offices in high-density residential districts.

"One side or end of the (best retail) block is usually better than the other . . . normally, the better side or end is in the direction of the town's growth. Usually such growth is towards the town's best residential area. . . . In many of the larger cities, a majority of the volume of a city's retail business is conducted outside the central shopping district." (33)

Clinics or medical arts buildings belong near the centers of their tributary populations. If a small city develops an industrial area residential sections will grow elsewhere and groups of doctors' offices belong nearer the homes. Retail store "proximity to offices of professional men is desirable especially in outlying shopping centers. People having appointments with doctors, dentists, lawyers, etc., quite often will become shoppers if stores are conveniently accessible." (33)

Office buildings or office space to accommodate any sizable office organization, according to the Urban Land Institute, however, are "not desirable as a rule in outlying centers, increase trade very little, and unless rigidly controlled, will usurp all day parking space which should be reserved for shoppers. . . . Professional offices, particularly doctors and dentists where they occur in any number, are in the same category. They are expensive tenants, janitor service alone running about two times that of other tenants. Where they cannot be accommodated in second floor locations, the provision of a semi-residential type of building located to act as a buffer between the center and adjacent residential development is a satisfactory solution." (30)

The general purpose buildings with which we are mainly concerned, therefore, belong still nearer the business centers or in local retail districts. Cleveland has a regulation limiting to five persons the number of employees in business offices in such local retail business districts.

A buffer area is provided by transition zoning regulations in some cities to avoid undesirable use-district relationships. These may occur between residential and local retail or residential and industrial districts.

There are a number of zoning techniques for controlling bulk of buildings and density of population. Height, cubage and lot coverage limits are familiar to most urban architects. A more recently developed measure which has somewhat more critical value is the so-called "Floor Area Ratio" (ratio between total floor space — out-to-out dimensions all floors except ground floor — and total area of lot measured to street lines).

Left: Precision work in low-density zone. Technical Instrument Company, Houston, Texas. MacKie & Kamrath, Architects
Right: Semi-residential transition. Thornhill-Craver Co., Houston, Texas. MacKie & Kamrath, Architects

Mears Studio Photos

Application of this to a tall building may result in a ratio of 25 to 30. A two-story taxpayer will show a ratio of less than unity. Between such limits zoning classifications may be established in any city to regulate building bulk and population much more satisfactorily than cubage and height, for instance; these because of variation in story heights, have less relation to occupancy.

Complete zoning control, of course, must also include regulations to assure light and air and amortization of non-conforming uses.

Parking: There is considerable national variety in existing zoning controls of parking facilities. A 1947 study (36) of 70 cities from 50,000–100,000 population showed 21% required parking for office buildings and, of 22 cities reporting loading, 24% required loading areas for office buildings. Some other larger city rules and proposals are tabulated below:

Detroit	1 space/400sf for office buildings
Los Angeles	1 space/100sf business & commercial over 7500sf
Minneapolis (proposed)	1 space/100sf business & commercial over 500sf
San Francisco (proposed)	1 space/450sf banks, business or professional offices
South Central Connecticut regional zoning. (proposed)	1 space/250sf ground floor 1 space/500sf upper floors less than 500 ft. distant

The Urban Land Institute reports favorably on a parking solution for large cities consisting of fringe or marginal parking areas served by shuttle buses traveling from one parking area to another across a city.

One of the best studies of all phases of the parking problem is the 181-page Parking Manual issued in 1946 by the American Automobile Association's Traffic Engineering & Safety Department. "The trend for parking to be considered as a public use is reflected in the fact that 33 states have passed legislation permitting municipalities to undertake the provision of off-street parking . . . as a municipal function." (35)

The Urban Land Institute further recommends that "All leases should prohibit employers or employees from parking their cars in 100% business parking stations. . . . Employees' parking should be in the (more remote) locations even if a walk of two to three blocks is required." (30)

Planning (*See Bibliography references 38–63*)

Branch Office Procedure

Large organizations with many branch offices often have their own locations, field office planning, or branch office layout departments. These establish planning, equipment, materials and finish standards, make surveys of existing space being considered, prepare layouts, schedule and supervise the work. Local architects are retained when the alteration is of sufficient size, or for new buildings. The accompanying data indicate the approach of such company planning departments which is largely concerned, as far as appearances go, with identification of the branch office as a unit of the parent company. There are also obvious advantages of mass purchasing and standardized planning.

Such organizations usually have Branch Office Manuals or Inspection Checklists for selection of location and assembly of data on proposed offices in new or existing structures.

Stockbrokers are another desirable tenant for a small business building. Merrill Lynch, Pierce, Fenner & Beane, securities and commodities brokers, for example, have approximately 100 branch offices which are usually in ground or second floor locations for the convenience of clients. Their essential policies are clear identification as a Merrill Lynch operation and insistence on privacy of the customer's business.

Identification is effected by simple standardized equipment, uniform arrangement, decoration and services. Privacy is assured by a plan arrangement which always permits a customer to go to the Manager's office, to the cashier and to visit the investment department without passing through the crowded boardroom. The wire operators are also placed in a private location adjacent to the cage.

Standard partitions of two heights have been carefully designed for company use. Private offices and cages are enclosed by 66 in. walnut and glass partitions. Account-executive booths, which must permit vision of the board and yet give privacy to conversation and papers, are 36 in. walnut plus 9 in. glass. The booths are approximately 6 x 6 ft (single) and 6 x 12 ft (double).

Branch offices of this organization range from about 1000 sf to 5000 sf in area. The standardized quotation board of silicate slate sections has approximately 36 lf of arc set on varying radii (22–35 ft) and requires considerable ingenuity in planning for vision. Where Teleregister automatic quotation service is available it is replacing these chalkboards.

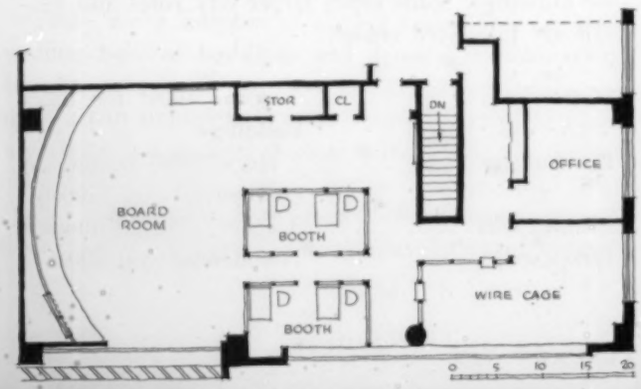
Each account-executive must have quick access to the wire operator. In larger installations message conveyor-belts are provided; in most cases an ample and direct passage is essential.

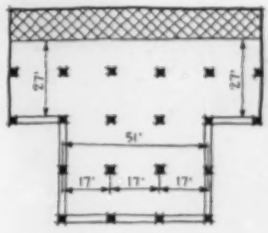
It is company policy to provide complete air conditioning, acoustic treatment and usually fluorescent lighting. The Locations Executive sums up this policy as follows: "Our design of offices is intended to provide the maximum convenience, efficiency and comfort for the account-executives who are the producers and also for the operating employees, the cashier and his staff and the wire operators. Although all our customers visit the offices at some time or other, taken by and large, over 90% of our business originates over the telephone and we must be set up to handle it rapidly and above all things, accurately."

Problem Space

Some characteristics of undesirable space are shown on page 102. Branch office experience in renting offices all over the country yields some additional items.

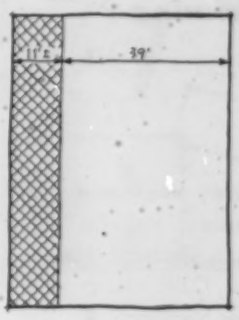
Standard equipment, brokerage office, Merrill Lynch, Pierce, Fenner & Beane; left, office in Orlando, Fla.; James Gamble Rogers III, Archt. Below, office, Phoenix, Ariz.

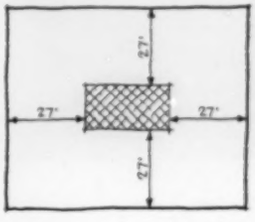




Left:
Depth and span dimensions proposed by a real estate and office layout specialist

Right:
Actual plan, 6-story Remington-Rand Building, Philadelphia; Thalheimer & Weitz, architects; completely free for any partition arrangement desired





Left:
Optimum space for general offices suggested by a business man; the tenant's point of view

Right:
Clear span recommendations made by office layout division of an office equipment manufacturer

Shape of space and location of services

A major insurance company finds a tendency for the type of building they occupy as second floor tenants to be designed primarily for the first floor. Public stairs located at one side of a wide building and similar locations of toilets increase travel distances and complicate office planning. Long narrow space is equally bad since it is impossible to plan for group meetings. They favor a plan which permits rental of an end of a floor or a wing incorporating corridor space. This occasionally involves access to a fire exit but some codes permit locking such access if the office doors have large glazed areas. Elevators and utility stacks should be located so as not to crowd or make rentable space irregular.

Space planning and flexibility

The architect must reconcile many points of view on office space. Each project will have its own special conditions but the accompanying diagrams indicate some span and depth recommendations by various authorities.

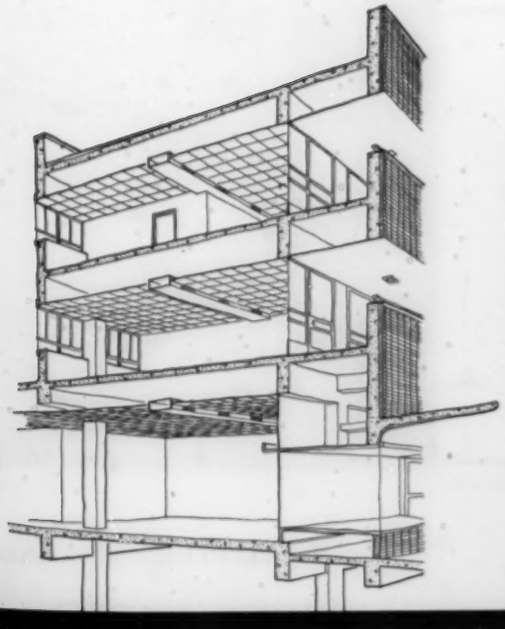
Flexibility of office arrangements is important for the commercial office building because of changing requirements of both present and new tenants. For office purposes flexibility is often measured by spacing of window mullions which permits subdivision into various office widths. Mullions spacing recommendations vary from 3 ft 6 in. to 4 ft and 4 ft 6 in., giving multiples of:

7, 10–6, 14, 17–6, 21
8, 12, 16, 20, 24
9, 12–6, 18, 22–6, 27

(Note: 18 ft clear spans imply approximately 20 ft column center spans which work out for 4 ft 0 in. mullion spacing.)

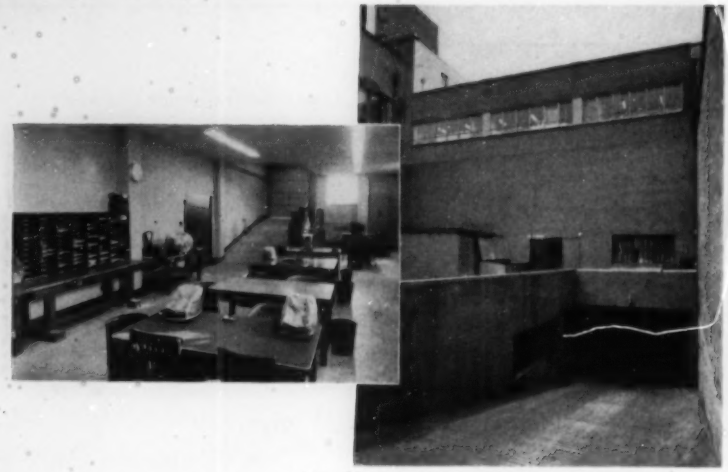
Use of stock 6 ft linoleum and 9 ft and 12 ft carpet widths for determination of office widths has been considered an economy factor by some planners.

The Sill Building, designed by Kump & Falk, has an arrangement of corridors on top of window sun-screens which results in increased flexibility. A climate in which



Section and view, exterior corridor, Sill Building, Bakersfield, Calif. (photo: Roger Sturtevant). All services in flush hung ceiling of removable tiles; partitions demountable — an invaluable aid to flexibility

Planning



Delivery facilities: left, Esso Headquarters, Richmond, Va., Carneal & Johnston, Archts. (Photo: Dementi). Right, Sill Building, Bakersfield, Calif., Kump & Falk, Archts. (Photo: Roger Sturtevant)

exterior gallery-corridors of this type are appropriate gives this opportunity to free the plan of non-revenue space.

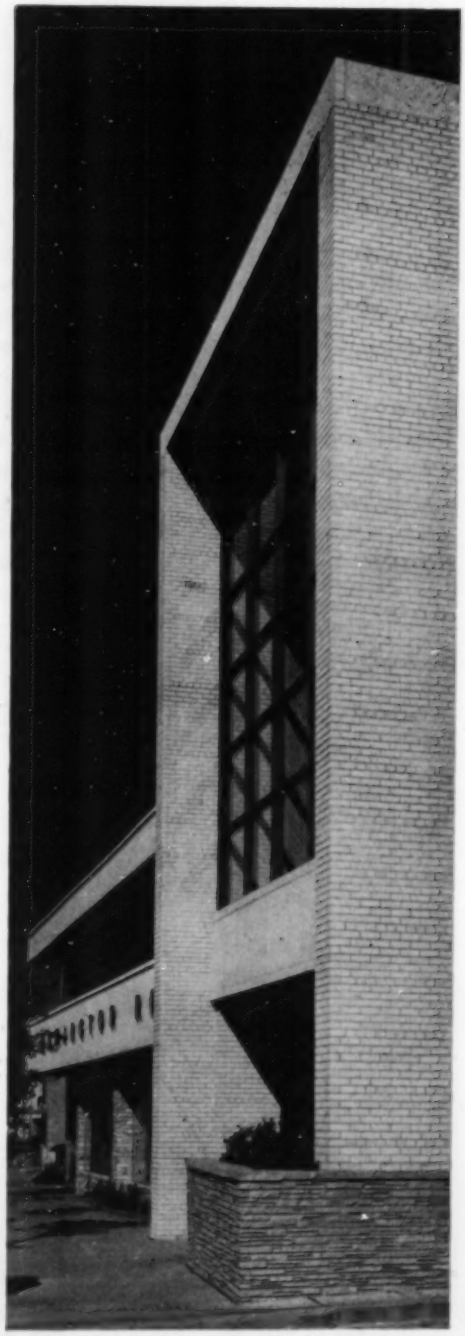
Facilities

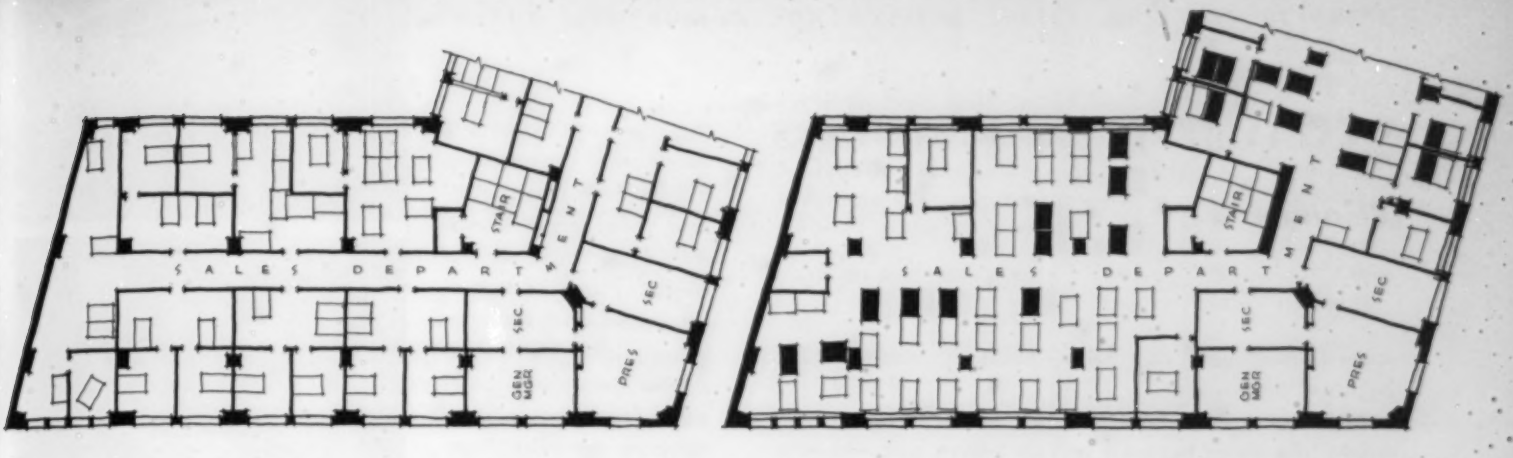
An architect may help increase the rental values and tenant-holding ability of a commercial building by persuading the owner to consider certain additional equipment and amenities as a part of the basic building. Their cost is insignificant in relation to loss of revenue from vacancies.

Branch office experts all emphasize the importance of knowing who installs and who pays for utilities, lighting fixtures, water heaters, air conditioning, toilet room accessories, various maintenance services and alterations. Many buildings offered for use of companies of national scope are inadequately equipped and leases may provide that tenant-installed items become property of owner when lease expires. The following typical examples of inadequacy have resulted in selection of other buildings: Single and bare toilet rooms instead of separate and properly equipped facilities for men and women, no hot water, lack of freight elevators or hoisting facilities, no loading or large object access, insufficient security of rear windows, inadequate wiring for equipment loads.

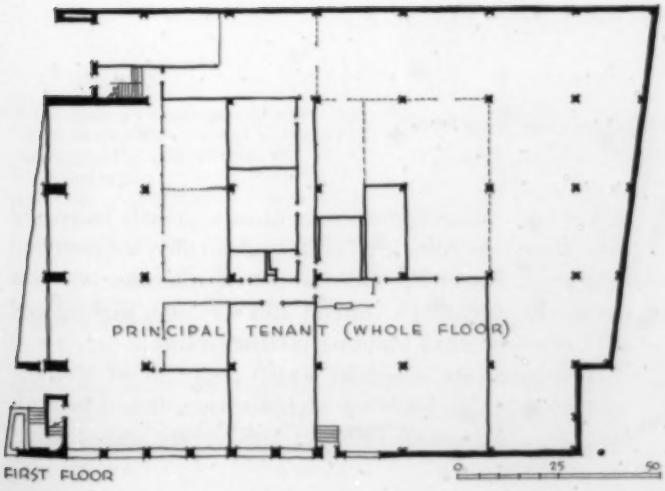
Expansion and preplanned Growth

Expansion of a building obviously can be either horizontal or vertical. There are many examples of preplanning both varieties, by plot plan or structural provisions for the future space. Another method is to construct more space than needed for the major occupant and lease the extra area on a temporary basis, planning and earmarking it for expansion needs. A final type is internal — re-study of space for more efficient layout. This also may be preplanned by providing excessive areas for original occupancy, such as conference rooms for later conversion to private offices or loose arrangements of desks and equipment for eventual tighter planning. The private office is declining in favor among management experts and space-saving conversion of private office

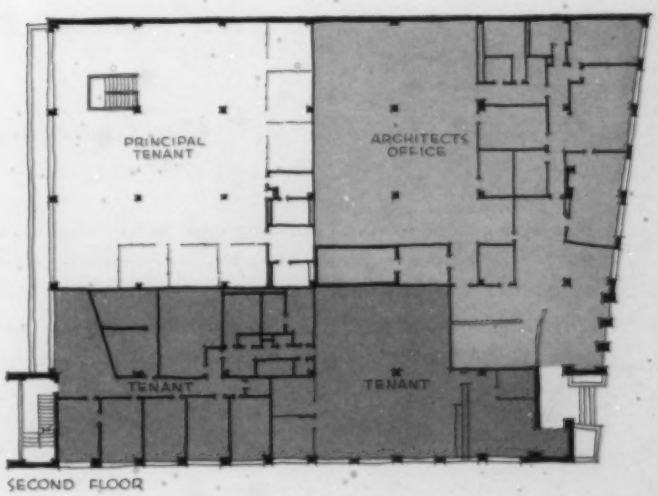




Plans above show economy of open office space; an actual office replanning done by an office equipment company. Black squares are desks added after replanning. Photos (by William Langley) and plans below: office building in Dallas, Texas, takes advantage of sloping site; two story portion occupied by Remington-Rand, some space for other tenants, one-story portion entered from next street, occupied by the building's designers, George L. Dahl, architects and engineers



FIRST FLOOR



SECOND FLOOR

Planning

space to pools and general office areas has been accepted by many institutions.

Planning which eliminates the double-circulation of connecting doors between private offices will also save space. Departments which are expected to expand should be placed next to available or easily altered space.

Top, general offices planned for growth, International Business Machines, Portland, Ore. (Photo: Photo-Art). Right, offices divided merely by curtains to permit expansion (can be thrown into one) or to simplify permanent subdivision if that should become necessary; own office, Page, Southerland & Page, Architects, Austin, Tex.

Features — Equipment — Materials

There has been much written in recent years about "integrated design," perhaps without any full realization of what the words mean and imply. The term involves completeness of parts and relationships, clearly defined functional expression; and is closely related to that other catchword, integrity or honesty. It implies an esthetic and practical marriage of architecture and engineering throughout the job. This so works that it is impossible to draw a line and proclaim: this is architecture, this is engineering. It is design in three-dimensions, completely conditioned for use and appearance. In addition to space and circulation such conditioning includes:

- Atmosphere (air conditioning, etc.)
- Orientation (sun screens)
- Light (natural & artificial)
- Color (bibliography 81–83)
- Sound control (machine areas, general space)
- Finish materials (bibliography 72–80)
- Maintenance facility (including window cleaning, accessibility of mechanical equipment)
- Utility availability (wiring for business machines, telephone ducts)
- Ease of alteration (smooth ceilings for uniform partition heights, re-usable partitions, etc.)
- Structural fitness (appropriate floor load capacities)

Air Conditioning

"It has long been our opinion that Architects in this locality could not afford to work in a building that was not air conditioned and the improvement in the performance of our force since occupying this building has strengthened this opinion" (Page, Southerland and Page, Texas architects).

A tendency to provide complete air conditioning results in increased floor-to-floor heights often with ducts above removable ceiling installations. This affects relationship between cubage and square feet of space in such manner as to change former valuation standards. In some large buildings air conditioning is available on a rental basis and can be a most profitable business.

Increased use of business machines results in heavier air conditioning loads, particularly where operation requires 100% duty. Typical outputs:

Card-punching machine	150 btu/hr
Accounting machine	4000 btu/hr

Heavy electronic equipment used in some home office installations may require several tons of refrigeration.

Fire Insurance *(Bibliography references 84–92)*

Conformance to local building code is not enough for the commercial building. Construction system, selection of materials, equipment, plan and proposed occupancy must also be reviewed to obtain lower insurance rates. The accompanying hypothetical case comparison illustrates the importance of this factor of operating budgets. Experienced building owners expect architects to submit insurance data along with plans and specifications.

A change in occupancy may cause a greatly increased rate. Rate schedules are further subdivided for contents insurance. Naturally these kinds of insurance are not under the architect's control and we have highlighted only the subject of building insurance rate.

Insurance rate schedules which apply to 90% of the examples of this building type are established in each state by a state-wide fire insurance rating organization

EXAMPLE OF FIRE INSURANCE COMPARISON FOR TYPICAL SMALL BUSINESS BUILDING

Assume area 20,000 sf

	Area	Height floor-to-floor	Occupancy
basement	20,000 sf	11 ft	retail storage heating plant
1st floor	20,000 sf	15 ft	retail
2nd floor	20,000 sf	12 ft	offices & light occupancy

CASE A: FIRE-RESISTIVE; rate per $100 is .035

basement	20,000 x 11 = 220,000 cf @ $ .50 =	$110,000.
1st–2nd	20,000 x 27 = 540,000 cf @ 1.12 =	604,000.
Fire-resistive total construction estimate		$714,800.

CASE B: NON-FIRE-RESISTIVE; rate is .560

basement	220,000 cf @ $ .50 =	$110,000.
1st–2nd	540,000 cf @ .94 =	507,600.
Non-fire-resistive total construction est.		$617,600.
Difference in construction estimates		$ 97,200.

CASE A: yearly ins. cost = $\frac{\$714,800 \times .035}{\$100.}$ = $ 250.18 per year

CASE B: $\frac{\$617,600 \times .560}{\$100.}$ = $ 3,458.56 per year at 100% valuation

In 20 years on annual renewals (can be bettered on term privileges):

CASE B:	$ 69,171.20
CASE A:	$ 5,003.60
SAVING	$ 64,167.60

71% of construction difference

(Note: Interest, taxes, maintenance, etc., disregarded)

(Estimating data from Murphy Brinkworth Construction Corporation)

supported by the fire insurance stock companies (although a few mutual companies participate) under state government supervision. Separate schedules are developed for each class of occupancy (mercantile, manufacturing, etc.) and for fire-resistive and non-fire-resistive construction.

An architect may save his client thousands of dollars over the life of a building by an insurance review and plan revision before construction. The National Building Code recommended by the National Board of Fire Underwriters (84) (which also considers general safety provisions) will serve as a guide to approved practice. The 1949 edition is in form appropriate for adoption as a local municipal building code. Previous editions have been so adopted by over 100 cities. When practical difficulties arise in a specific job a recommendation may be obtained from the nearest office of the state fire insurance rating organization.

Decisions on fire protection and safety features will depend on a comparison of construction costs of alternate plans and corresponding insurance rates. Protection of vertical openings, exposure to and "communications" with adjacent hazards are important factors in determining rates. The schedules also provide protectional credits for the following items:

automatic fire alarms
standpipes
automatic sprinklers
watchmen, clock and special building signals
fire pumps
fire pails and extinguishers

It will be found uneconomic to provide elaborate protection for ordinary light occupancies. As in any other analysis such a study can be prepared only for a specific building. In usual projects it need not require a formal or lengthy review.

To sum up, fire insurance rates are predicted on construction, protection, occupancy and exposure. The building valuation to which rates are applied is entirely the responsibility of the insured party. The schedules list items, to be added or deducted in order to arrive at the rate, in cents per $100 valuation per year.

ANNOTATED BIBLIOGRAPHY

After each reference one or more code letters indicates the content of the article according to the following key:

b bibliography	**m** maps
d details or diagrams	**p** plans
f forms	**s** sketches
g graphs or charts	**t** tables
	v photo views

Several specialized periodicals are listed at the end of the main body of references.

REAL ESTATE, FINANCE & OPERATION

1. Lench, Charles H. *The promotion of commercial buildings.* Architectural Economics Press, N. Y., 1932. 253 pp. Chapter XVI: Financial set-up pp. 141–156. Chapter XXII: Office Buildings pp. 206–211.

2. Holmes, Lawrence G., Editor. *The real estate handbook.* Prentice-Hall, N. Y., 1948. 783 pp. Comprehensive real estate reference data. **dfptv**

3. McMichael, Stanley L. *How to operate a real estate business.* Prentice-Hall, N. Y., 1947. 455 pp., Site selection: (1) Outlying neighborhoods; (2) Satellite towns; (3) Natural traffic intersections. **dftv**

4. *Real estate business* (Basic information sources). U. S. Department of Commerce, Office of Domestic Commerce. GPO 1949. 8 pp. Governmental & non-governmental books, periodicals, bibliographies, lists of associations, directories & services. **b**

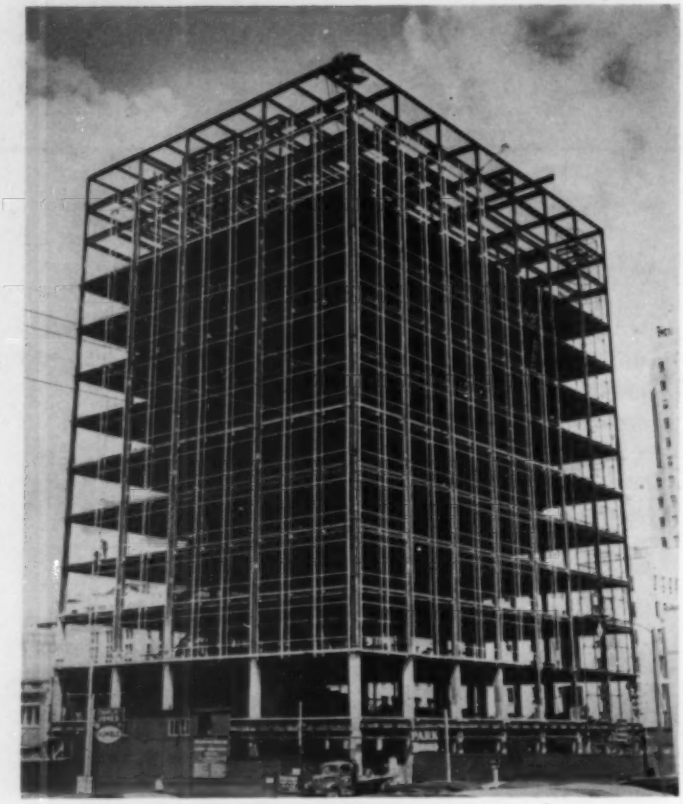
5. "How inside space can earn outside rates." By George R. Bailey. *Buildings*, Aug., 49:44. Top grade space throughout building by use of air conditioning, lighting, decoration, acoustic treatment, furnishing. **d**

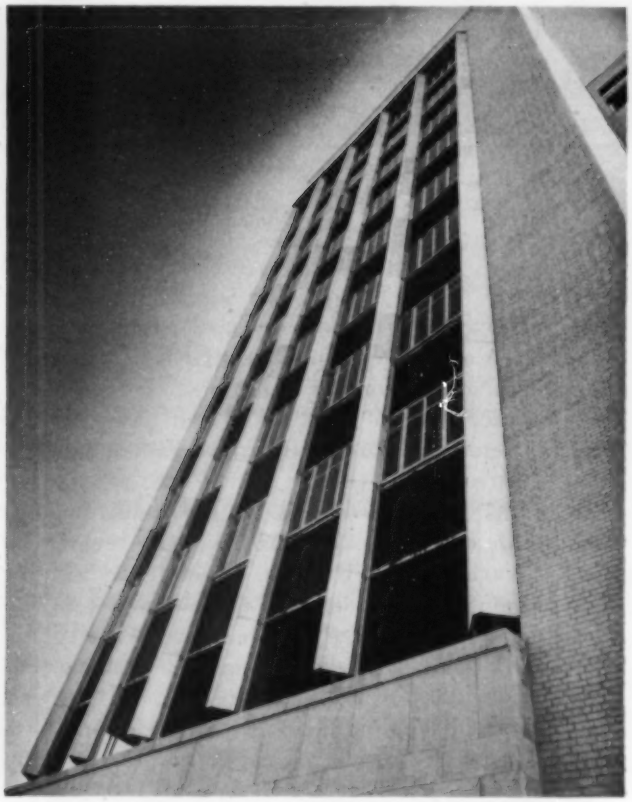
6. "New buildings may have metal walls." By R. L. Davison. *Buildings*, July 44:45–46. Additions to rentable area & increased total rent due to decreased wall thicknesses now approved.

7. "What is a fair rental rate?" By Le G. Moore. *Buildings*, July 49:30–31 (Part I), Aug. 49:30–31 (Part II). Examples & calculations for existing & new building financial set-ups.

(*Continued on page 150*)

Photos: Left, Pollard and Pollard Studio. Right, Wm. Langley





Texas Employers Insurance Association and Employers Casualty Building, Dallas, Texas

AIR CONDITIONING WORKS WITH DESIGN

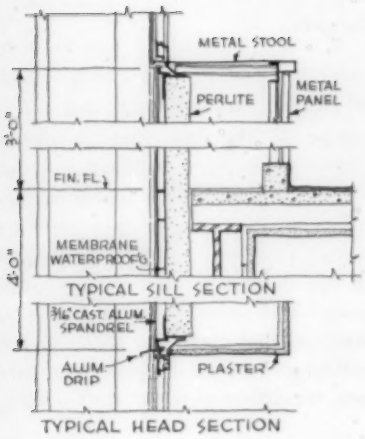
for space utilization, flexibility, economy

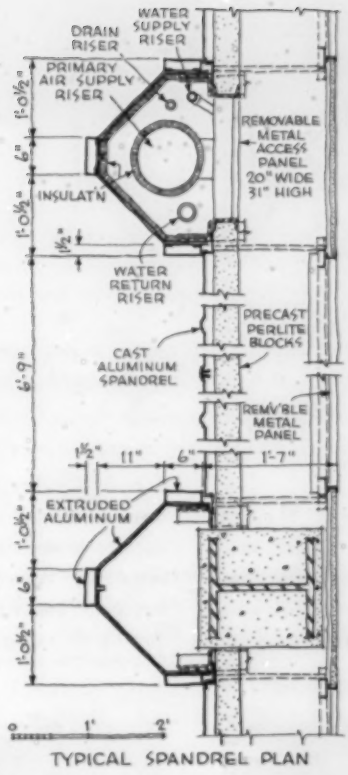
George L. Dahl, Architects and Engineers

THE tall, vertical fins which stretch up three sides of this Dallas office building would hardly be thought of as an essential part of its air conditioning system. But actually they conceal the pipes and ducts which heat or cool areas facing the outside.

This is just one of several ways in which air conditioning ties in with the design of the structure. In addition, the heavy air conditioning equipment is at the top of the building. Air distribution of the central zones is designed to permit major changes in room partitions without the air conditioning system being disturbed. And in keeping with these concepts, one of the newest developments in refrigeration equipment is being used.

This fourteen-story office building, with basement, is sheathed in aluminum and glass with the lower store fronts being limestone and granite and the uppermost and rear sections, cream-





Pipes and air supply riser providing air conditioning for exterior office zones do not take up valuable space, but instead are installed in aluminum fins on the outside of the building. Access panels replace insulating blocks behind fins where pipe lines lead into offices to connect with conditioners. Aluminum spandrel panels indicated on drawings had not been installed in progress photo, (left)

colored brick. It is scheduled for occupancy February 1, 1950.

Air Conditioning Piping Outside the Building

The air and water used for air conditioning the exterior zones is distributed from the twelfth floor down the outside of the building. Pipe lines encased in the triangular aluminum pilasters or fins run from the third floor to a point halfway between the twelfth and thirteenth floors.

Besides being functional, the placement of these pipes on the exterior of the building structure accomplishes the dream of designers to have straight lines in the building interior. Except for windows, each interior face of the exterior wall is a flat surface. Each fin carries an air conduit, two water pipes and a drain which, together with window conditioner units, comprise the high pressure conduit type of air conditioning employed. The air conduit, 13 in. in diameter in some places, would make an appreciable encroachment in the occupied space if it were installed in the conventional manner. So to eliminate this, the piping and air conduit were placed in the vertical fins on the outside of the structure. These fins, made of aluminum and insulated on the inside with 1 in. of blanket-type insulation, form the main motif of the building. Precast perlite blocks provide backup insulation for the aluminum fins and spandrel panels. At each floor there are runouts from the pipes in the fins to window units which air condition the exterior zones.

Central Heating and Cooling Zones

In order to attain a high degree of flexibility in location of partitions, the conditioned air in the central zones is distributed through a perforated tile ceiling. The use of metal perforated tile and acoustical pads allows the air supply to be shifted from one section of the ceiling to another without changing its appearance.

Air is discharged from ductwork between the suspended ceiling and the floor slab above; wherever an air outlet is needed, the acoustical pads are omitted. It is possible, therefore, to change the air distribution at will simply by moving the acoustical pads from one cell to another. The cells are held in place by friction clamps of a T-bar type of construction. The use of flush troffer fluorescent lights makes it possible for lights and tile to be interchangeable. Partitions can be rearranged without involving extensive time and cost in modifying air conditioning and lighting to suit the new partition pattern.

Heavy Air Conditioning Equipment on Top Floors

In the early design stages, it was decided that, functionally and economically, it would be feasible to locate major air conditioning equipment on the top floors. The space in the basement was considered too valuable to give up for boiler and machine room space. With the type of heating and cooling planned, this did not impose any difficult engineering problems.

Structurally, the building had to be strengthened somewhat to carry the weight imposed by the air conditioning equipment. This weight, however, is quite minor in comparison to the normal loads the structure has to carry. A small amount of space is gained throughout the building itself because no bulky stacks go up through the building, and there are no condenser water pipes to take up space.

Since the architectural treatment of the building necessitates that the central air handling system be located at the top of the building, there is a large saving in piping because of the proximity of the refrigerating equipment to the major air cooling system. Likewise, sav-

ings are made in steam piping by having the boilers located adjacent to the major steam consuming apparatus.

Latest in Refrigeration Units Used

Contrary to the popular concept, steam, ordinarily used for heating only, is also being used for refrigeration. Steam absorption units, successfully used in several pilot installations, and just recently placed on the active market, were selected to provide the refrigeration. While they are, in this case, a little more expensive than centrifugal machines, it is anticipated that a lower operating cost will effect a worthwhile saving in power costs. The new unit uses plain water as a refrigerant and a simple salt as an absorbent. Water to be chilled is sprayed into an evaporator maintained at an almost perfect vacuum. Due to this high vacuum, a portion of the water vaporizes, cooling the remaining water which is pumped to the load.

The vaporized water goes into an absorber where it is taken up by the salt solution. The heat liberated by the absorption of the water vapor is transferred to cooling water.

Since the absorption of the water vapor reduces the salt concentration of the solution (reducing its absorbing power) it must be reconcentrated. Steam heats the solution and boils off the water vapor previously absorbed by the salt solution.

The absorption principle is not new. However, it has been in extremely limited use for heavy duty applications because of the lack of a refrigerant-absorbent combination that was both safe and efficient. Machines of this type using ammonia are not suitable for air conditioning because of the toxic qualities of ammonia.

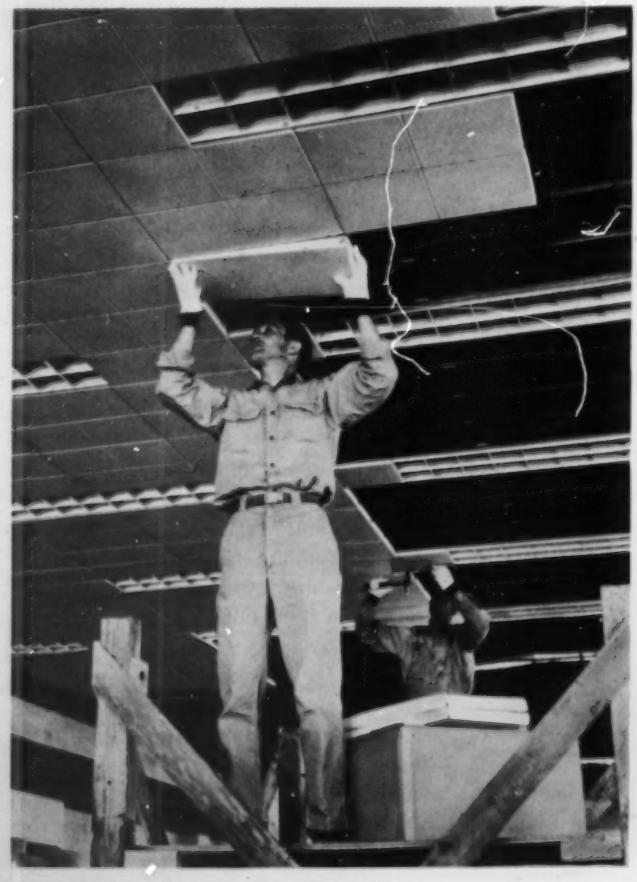
Special Ventilation for Basement Garage

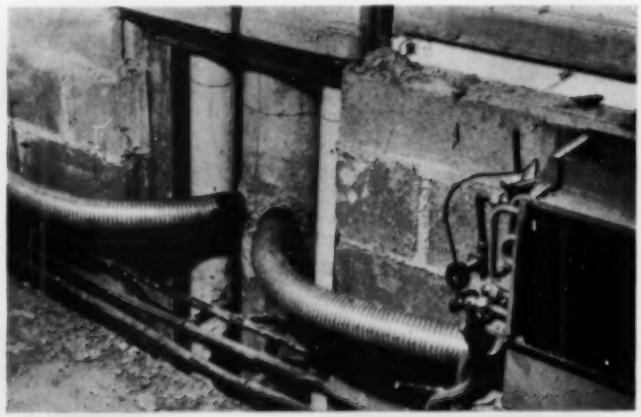
Most of the basement is for car storage. Mechanical ventilation is provided to safeguard the health of those working in the area. Large quantities of air travel the full length of the garage, and are then exhausted by mechanical means. The exhaust ductwork is arranged so that there are grilles at both the floor and ceiling to insure removal of gases, regardless of where they collect.

Conditioned air for central zones comes through portion of metal perforated ceiling where sound absorbing pads are left out. Use of perforated tile ceiling and the type of fluorescent troffer shown allows rearrangement of partitions for new offices with minimum loss of time and complete salvage of original material

Top: primary air and water lines coming into the room air conditioners from the aluminum fins. Primary air discharged through nozzles in the conditioner causes recirculation of room air over secondary heating-cooling coil (seen at extreme right). Bottom: major air conditioning equipment is on top floors. Shown here are the steam refrigerating units; plain water does the cooling

Wm. Langley Photos





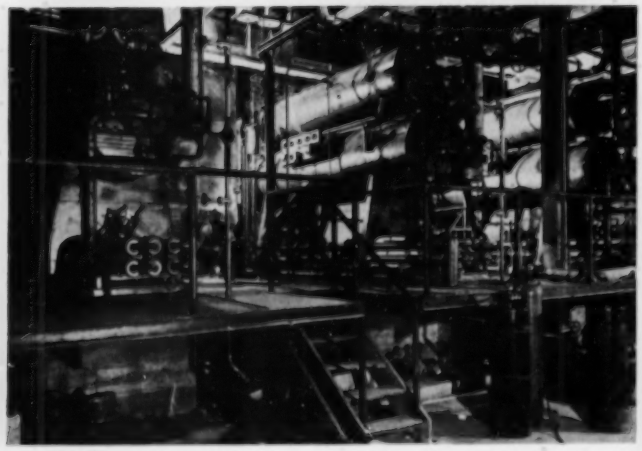


Fig. 1

This startling collection of water on the floor joists over a crawl space came from the soil. Without ventilation or soil covering in crawl spaces, structural members frequently become cold enough to condense moisture out of the air

PREVENTING CONDENSATION IN DWELLINGS

Based on a new booklet* published by the Housing and Home Finance Agency, this article explains the causes of condensation troubles in dwellings, tells why they are more prevalent today, and sets down recommended practice to prevent them. Construction details showing vapor barrier installation will be taken up in next month's and subsequent Time-Saver Standards

A FEW years ago little or no attention was given to condensation in dwellings. Either it did not occur or was so minute that it was not a serious problem. Difficulties resulting from lack of condensation control, such as paint peeling and wood decay, have increased recently, and many troubles little understood heretofore are now attributed to lack of sound condensation control practices. Presented here are recommended methods of condensation control by the use of vapor barriers and ventilation based on engineering tests and practical experience, and applicable mainly to small house construction.

Why Condensation Troubles Today?

Condensation troubles are more prevalent now because dwellings have higher relative humidities than before. High prices, the scarcity of building materials, and other economic conditions favor the building of smaller, more compact houses, with resultant higher humidities. Improvements in the machining of wood parts, new materials, and the use of weather strips and storm windows now make both new and old houses tighter than formerly by restricting air leakage or infiltration. Humidifiers, when used indiscriminately, sometimes add greatly to the condensation problem, especially during extremely cold weather.

Today, people make more extensive use of appliances discharging water vapor into the living space than in the past, thus making condensation control more essential. Basements are frequently omitted in low-cost construction, and instead there is substituted an enclosed crawl space below the building. This crawl space may often be damp and thus contribute large quantities of water vapor which may find its way up into walls, attics, and living areas.

Thermal insulation is also used to a greater extent than formerly and as a consequence, outside wall surfacing materials (sheathing and siding) are somewhat colder than those of uninsulated construction. The use of thermal insulation, however, is not, as is often assumed, the only factor contributing to condensation nor does it attract moisture. It must, however, be properly installed with whatever collateral materials or other means that are necessary to prevent condensation trouble.

Common Troubles

One of the most common and widespread types of damage for which condensation is often responsible is in exterior painting. Condensed water vapor often collects behind the siding of a building in the form of free water or ice. This excess moisture may absorb extractives from the wood and result in stains as it runs out over the surface of the siding. In some cases the condensate thoroughly soaks the siding, causing paint blisters and early paint peeling. If moist conditions prevail for a long enough time, decay may also result.

Another type of condensation damage may occur in houses having unventilated flat roofs. Sometimes water vapor passes through the ceiling and condenses on the roof sheathing from which it drips back to the ceiling, causing the plaster to crack.

In basementless houses without crawl space ventilation or soil cover, the outside walls, plate, sills, and adjoining joists exposed in the crawl space of the building are often cooled to temperatures below the dew point in the enclosed space. When this happens water often condenses on the surfaces in sufficient quantity to produce conditions favorable to decay. This is illustrated in Figure 1.

Figure 2 shows a house with pitched roof in which water vapor entering the attic space from the occupied area condensed near the eaves where the structural parts were colder than in the occupied area of the building. The arrows indicate where decay started.

* *"Condensation Control in Dwelling Construction" by Forest Products Laboratory, Forest Service, U. S. Dept. of Agriculture in collaboration with the technical staff of HHFA. Available from Superintendent of Documents, Government Printing Office, Washington, D. C., 20 cents.*

Control Methods

Condensation control in dwellings is possible by the proper use of vapor barriers, ventilation or a combination of both. Vapor barriers are membranes, aluminum or oil paint films, rubber base paints, metallic sheets, or other materials or coatings that prevent objectionable amounts of water vapor from being absorbed or transmitted through walls, floors, and ceilings. Vapor barriers are no better than their quality nor thoroughness of their installation. They should be selected for quality and should be carefully placed. Ventilation is suitable for reducing water vapor concentration in attics and in unheated crawl spaces below living quarters. In some dwellings it is desirable to provide ventilation for the living quarters in order to lower the relative humidity and thereby reduce condensation hazards.

Added roof protection at the eave line to prevent backing up of melted snow and ice is advisable. Trouble from this source is often erroneously blamed on condensation.

Many materials used as interior surfaces of outside walls, ceilings, and roofs will permit water vapor to pass through them slowly when the relative humidity or vapor pressure is different on opposite sides unless a vapor barrier is provided. When the relative humidity or vapor pressure within the house at the wall surface is greater than that within the wall, water vapor will migrate in the absence of an effective vapor barrier through the plaster or other finish into the wall cavity and will condense if it comes in contact with surfaces below its dew point. This process may continue throughout the heating season at varying rates depending on conditions in and out of the house.

The water vapor generated within a dwelling is first diffused through the space within the building, increasing the relative humidity. Some of it is absorbed by rugs, fabrics, and other house furnishings, and some is condensed on windows. This water may be removed slowly from the living quarters by the opening of outside doors, by diffusion through walls and ceilings into cavities or attic spaces, by leakage around windows and doors, by way of air supplied to burning fuel in heating equipment vented into chimneys, and by air exhausted by kitchen ventilating fans, etc.

Vapor Barriers. Adequate, well-installed vapor barriers are an effective means of preventing troublesome deposits of frost or water in walls and attics of houses exposed to low temperatures.* The vapor barrier should form a tight envelope near the warm side of the building element in which it is installed.

A number of satisfactory materials or combinations of materials are available that restrict the movement of water vapor. These include asphalt impregnated and coated papers having a glossy or bright finish. This feature is important since thin, dull-surfaced papers are not generally so effective as is the glossy finish. Duplex papers composed of two sheets of 30-lb kraft paper with a 60-lb per 3000 sq ft asphalt layer between them; aluminum foil mounted on one or two sides of a paper support, or attached to the plaster base; or aluminum paint, oil paint, or rubberbase paint in sufficient coats to result in a smooth glossy finish are types of material that may be expected to give satisfactory service.

Papers used to support insulating materials which have narrow strips of asphalt as an adhesive to join the paper and insulating materials are not usually good vapor barriers and their value for this purpose should be accurately confirmed before purchasing.

Sheathing. In contrast to the vapor-tight properties of the warm side of a wall, those of the cold side should be just the opposite — a construction capable of losing moisture that might gain entrance to the wall is highly desirable. On the other hand, the exterior sur-

** A good vapor barrier when installed should not have an average vapor transmission rate greater than 1.25 grains per sq ft, per hr, per in. of mercury differential including joints, fittings around outlet boxes, and the like. It should have sufficient mechanical strength to permit handling during erection without damage. It should also retain its vapor resistance qualities for the life of the building or, if a paint film, until it is renewed.*

Fig. 2

Condensation near the eaves of this attic is causing wood to decay (arrows). No attic ventilation or vapor barrier was provided. The house, located in Madison, Wis., was occupied in September, and the photo was taken in December

face must resist rain and strong winds. Sheathing paper, sometimes called breathing paper, between the sheathing and the finish siding has been customarily used to reduce infiltration of cold air and to prevent the penetration of wind-driven rain. In order that there be as little restriction as possible to the release of moisture, it is recommended that the sheathing paper and the sheathing be of types that will readily transmit water vapor.†

Ventilation. In proper amounts and correctly applied, ventilation is a recognized means of controlling condensation in buildings. By introducing fresh air into living quarters during the winter, some water vapor is forced out of the building, and air containing a low vapor content is introduced. In this way high vapor pressures which are a factor in producing condensation are reduced considerably. Ventilation is effective in preventing condensation in unheated attics, spaces below flat roofs, and crawl spaces in basementless houses. Although much is yet needed in experience and test data to prove the efficiency and effectiveness of ventilation in the cold cavities of walls to prevent condensation, there are some data indicating favorable results with an upward air movement on the cold side of any insulation in the cavity. This air movement should have the intake from the outside and should exhaust to the outside at the top of the wall unless provision is made to disperse the moisture added to other spaces above the wall. The burning of fuels for heating tends to increase the amount of fresh air entering a building and thus provides ventilation in the occupied spaces. No special provision is ordinarily made for it to enter since it usually gets in through infiltration around doors and windows. Where the construction is weather stripped and has tight exteriors, additional openings may be required.

Attic spaces are sometimes a source of trouble because of condensation on roof boards, shingles, or on long nails extending through the roof into the attic. Where the attic floor is well insulated, adequate ventilation in the attic is a safeguard against such condensation difficulties.

Ventilation in the cold cavities of walls by openings at both top and bottom is considered effective in preventing condensation in the cavity provided they open to the outside. Research to date indicates that 1 in. of opening per running foot of wall at both top and bottom is effective.

During the warmer months of the year a deposit of water or condensation is frequently found on basement walls and floors that are in contact with the soil. This type of water deposit is often confused with or thought to be water seeping through the concrete. In most cases, it does little harm; but where the floor or walls are covered with decorative materials, precautions are necessary to prevent decay or discoloration.

Good Practice Recommendations

Ventilator Size. There has been some confusion in the past on amounts of ventilation area intended when terms such as "area," "free area," "gross area," "net area," and just plain ventilation are used. The effect of air movement restriction such as (1) louvers, (2) fine mesh insect screen, and (3) grilles containing relatively small holes has not been completely understood.

For specification purposes and as used in the following discussion of amounts of ventilation recommended, the values given will be the "net amount of ventilation." The net area is the approximate unobstructed, clear or free opening through which air may move. The "gross area" is the total area of ventilator, louver, or grille and includes the net area as well as the solid material obstructing the flow of air. The relation between "net" and "gross" area for calculation purposes may be considered to be as set forth below:

Gross Ventilator Area = Net Area × Factor A

Ventilator Covering	"A"
1. ¼ in. mesh hardware cloth	1
2. screening, 8 mesh to the in.	1¼
3. insect screen, 16 mesh to the in.	2
4. louvers and ¼ in. mesh hardware cloth	2
5. louvers and screening, 8 mesh to the in.	2¼
6. louvers and insect screen, 16 mesh to the in.	3

† *A satisfactory sheathing paper or sheathing should be capable of passing 5 or more grains of water vapor per sq ft, per hr, per in. of mercury when tested by a dry method and should be resistant to wetting by free water and have satisfactory strength for handling and service.*

Fig. 3

Moisture condensing behind wood siding carried wood extractives over exterior surface, resulting in unsightly stains

Crawl Space Ventilation. If there is no other effective condensation control, and if the soil may be a large supplier of moisture to the crawl space, the total net amount of ventilation should be 2 sq ft per 100 lineal ft of building perimeter plus one-third of 1 per cent of the crawl space ground area.

Good practice in condensation control in crawl spaces includes the following:

1. At least four ventilating openings, with one near each corner of the building.
2. The openings should be placed as high as possible in the walls of the crawl spaces.
3. When the ventilation is the only means of condensation control, the ventilator should not be closed during any time of the year.
4. When ventilation serves as condensation control, insulation may be required in the floor and around exposed mechanical lines for comfort and to prevent deterioration.

Ground Cover. Where it is not practical to allow a free sweep of cold air below a dwelling floor, condensation in crawl spaces can be controlled by covering the ground with a vapor-resistant, durable material. A good water-proofed concrete slab or heavy roll roofing has been found effective. A roll roofing, either mineral surfaced or plain, weighing at least 55 lb per 100 sq ft, laid with 2-in. lapped joints over a rough-graded surface, should serve satisfactorily for many years. Generally, the lap joints need no cementing material.

Where a good cover is applied over the entire surface of the ground in the crawl space, very little ventilation is

Fig. 4

Map divides country into three zones so that recommended condensation control practices can be established for different outside design temperatures. Zone I roughly includes temperatures —20 F and colder; Zone II, 0 to —10 F; Zone III warmer than 0 F

needed. However, to be on the safe side, it is recommended that at least 10 per cent of the ventilation indicated by the two plus one-third formula (See "Ventilation") be provided.

Walls. It is recommended that where the walls contain materials adversely affected by moisture or by freezing in the presence of moisture, an effective vapor barrier be provided on the warm side of the wall under the following conditions:

1. When the wall is insulated so that the overall heat transmission coefficient ("U") is numerically lower than 0.25 Btu per hr, per sq ft, per degree Fahrenheit. This applies to dwelling construction erected in any of the three condensation zones shown on the map.

2. When the wall has siding, sheathing, or sheathing paper or any other material on the cold side of the wall which, as applied, has a water vapor permeability of less than 5 grains per hr, per sq ft, per 1 in. of mercury pressure differential, and the dwelling is located in Condensation Zones I or II.

Lofts or Attics. In many instances, ventilation has been counted on in the past for condensation control in lofts, attics, etc. Ventilation will still perform satisfactorily if effectively installed; this requires (1) an adequate amount, (2) proper location, (3) continuous operation, and (4) circulation through all spaces to be ventilated.

The table on this page sets forth recommended good practice for the usual conditions encountered in dwelling construction.

For flat roofs, ventilation at the eave lines only is not effective in itself. Vapor barriers are definitely recommended in addition to ventilation in all zones.

For roof construction where the ventilation is advantageously placed high in the gable ends, vapor barriers are not absolutely necessary except in the severe Condensation Zone I. A vapor barrier was omitted as a positive recommendation in Condensation Zone II and III because of costs.

Net amounts of ventilation in the table are given in fractions, thus: 1/300 or 1/600. They apply to the area of the building or part thereof at the eave line.

Recommended good practice — loft and attic ventilation [1]

Type of roof and occupancy	Condensation zone		
	I	II	III
(a) Flat roof — Slope less than 3 inches in 12 inches. No occupancy contemplated.	Total net area of ventilation should be 1/300th [2] distributed uniformly at the eaves *plus* a vapor barrier in the top story ceiling. Free circulation must be provided through all spaces.	Same as for zone I.	Same as for zone I.
(b) Gable roof — Slope over 3 inches in 12 inches. No occupancy contemplated.	Total net area of at least 2 louvers on opposite sides located near the ridge to be 1/300th [2] *plus* a vapor barrier in the top story ceiling.	Same ventilation as for zone I. A vapor barrier is not considered necessary.	Same as for zone II.
(c) Hip roof — No occupancy contemplated.	Total net area of ventilation should be 1/300th [2] with 1/600th [2] distributed uniformly at the eaves *and* 1/600th [2] located at the ridge with all spaces interconnected. A vapor barrier should also be used in the top story ceiling.	Same ventilation as for zone I. A vapor barrier is not considered necessary.	Same as for zone II.
(d) Gable or hip roof — With occupancy contemplated.	Total net area of ventilation should be 1/300th [2] with 1/600th [2] distributed uniformly at the eaves *and* 1/600th [2] located at the ridge with all spaces interconnected. A vapor barrier should also be used on the warm side of the top full story ceiling, the dwarf walls, the sloping part of the roof, and the attic story ceiling.	Same as for zone I.	Same as for zone I except that a vapor barrier is not considered necessary if insulation is omitted.

[1] *It is recognized that in many areas increased ventilation may be desirable for summer comfort.*
[2] *Refers to area enclosed within the building lines at the eave level.*

Photos courtesy Bakelite Corp.

MOUNTAIN INN

BUILT WITH PLASTICS

TERMED the "first truly representative architectural model for plastic materials," the Sky Line Inn atop Mt. Equinox in Vermont was fittingly dedicated at a recent meeting of the Society of the Plastics Industry, New England Section. Built by Dr. J. G. Davidson, an executive of one of the member companies, the inn when complete will consist of some 40 rooms.

Applications of plastics, both apparent and hidden, exist virtually from foundation to roof. The exterior was painted with a synthetic resin base paint. Both interior and exterior walls are phenolic resin-bonded plywood, and, between walls, plastics exist in the form of glass fiber mat insulation bonded with phenolic resins.

All rooms are heated by electric radiant panels consisting of conductive rubber sheets sandwiched between laminate insulating layers.

A remote control wiring system employs vinyl wire insulation for high dielectric and mechanical strength.

Sub-flooring is ¾-in. plywood bonded with synthetic resins to prevent buckling and warping. All finished flooring except for carpeted bedrooms is vinyl plastic floor tile.

There are wall coverings of plastic sheeting, and vinyl wall tile is featured in the bathrooms. Decorative laminates and sheeting are used for table tops, corner seats and chair upholstery. Draperies woven of glass are impregnated with plastic resins.

The Sky Line Inn presents thorough evidence of how proper use of modern plastic materials can open up new design possibilities along with high standards of economic service.

Above: plastic-bonded plywood, finished with synthetic resin paint, covers the exterior of Sky Line Inn. Below: plastics evident in the furnishings of the dining room and bar — table tops, chair and seat coverings, bar counter (bar front is tufted plastic), curtains and vinyl flooring

HEATING SYSTEMS FOR HOUSES

Cast Iron Baseboard Heating Systems: 1

By William J. McGuinness
Professor of Architectural Engineering
Pratt Institute

Comparison With Other Systems

Baseboards distribute heat better than standing radiators and are less conspicuous. Properly installed, there is less wall streaking because of the top seal strip and non-concentrated convection currents. Lower parts of rooms are warmer, as shown in Charts A and B, making it most adaptable to basementless construction. Response to starting and shutting off is quicker with baseboards than with radiant heating.

Heating Medium

Hot water forced circulation is the most adaptable heat source for baseboards and can be used in any of the three circuits sketched. Operation is like any hot water system using conventional radiation and operation cost is about the same. If there is a minimum wall space for base, heat losses can be cut by further insulation, double glazing, etc.

Adaptability to Old Buildings

Baseboards can be used in conversion jobs where gravity hot water systems are in use. Two pipe steam systems in larger buildings can be used with baseboards, but in one-pipe systems, the long run of condensing radiation makes it almost impossible to get the condensate out the same end as the steam enters.

Steps in Design

1. Determine Heat Loss. The usual calculations for hourly heat loss in BTU should be completed and recorded for each room in the sketch.

2. Select Baseboards And/Or Radiators. The order of preference for baseboard location is a) under windows, b) on outside walls, c) on inside walls. As a trial length, outside walls are measured and recorded in each room. Heat loss of the room per ft of baseboard should be computed. The max required output (515 BTU per ft in the living room) sets the water

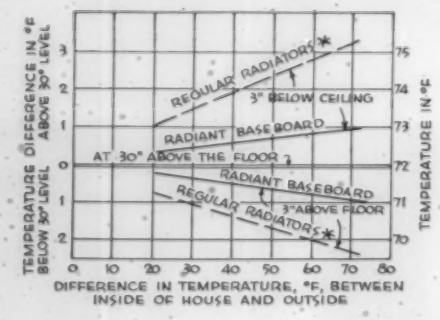


Chart A. *Room air temperature at various levels: at 70 deg inside to outside temp., a difference of 2 deg between floor and ceiling is shown for baseboards against almost 6 deg for radiators. *Small tube recessed radiators*

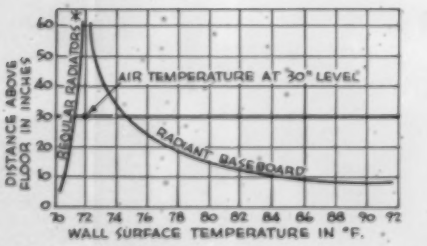
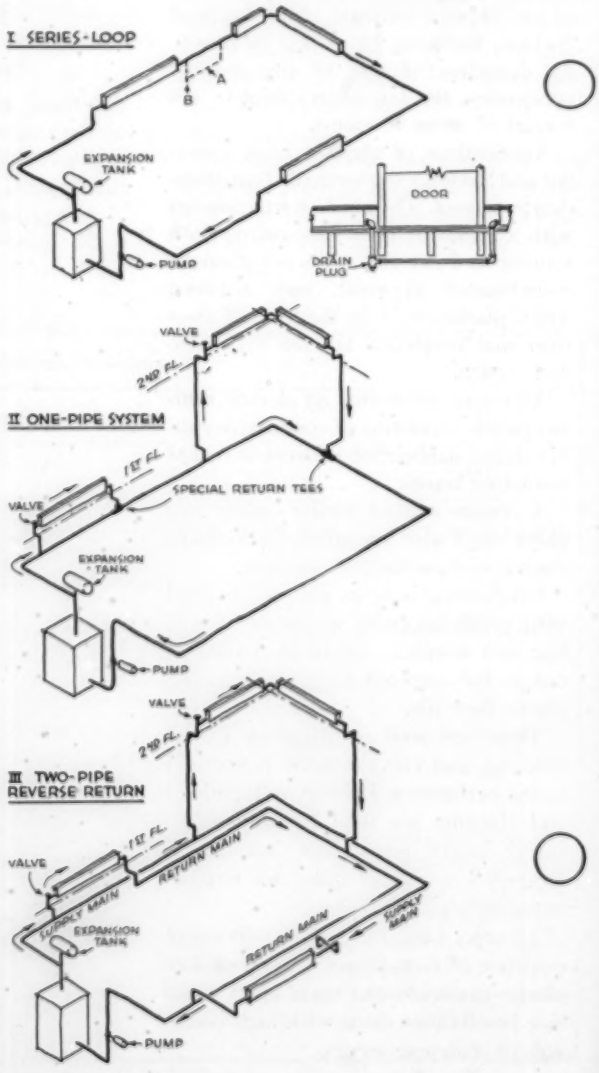


Chart B. *Radiant baseboard keeps lower walls warmer, overcomes cold floors. Overall mean radiant temp. is not higher with baseboards because radiators produce a hot ceiling. Studies made when temp. indoors at 30 in. level was 72 deg, outdoors 32 deg*



Circuits and Piping (Right)

I. Least expensive to install. Adequate heat but no individual control of units. If pipes drop to avoid doorways as at point A, drainage must be provided at point B.

II. Most popular for small and average size installations. Control of individual units by valves.

III. Best for large installations. Each base element controlled separately and receives water at max. temp. directly from supply main

---

Note: Charts A and B from University of Illinois Bulletin No. 358 — A Study of Radiant Baseboard Heating.

HEATING SYSTEMS FOR HOUSES

By William J. McGuinness

Cast Iron Baseboard Heating Systems: 2 — Types of Heaters

temperature which must be used throughout the system. In this case 200 F (the max recommended by some manufacturers) is chosen as the average water temperature and results in base lengths which fit the space. Base of the desired height and type may be selected from Tables 5–8 to make up heat losses. Cast iron radiators may be used with cast iron baseboards. Table 3 gives a heat emission of 210 BTU per hr for 1 sq ft of radiation at 200 F. Dividing the loss in the kitchen and bathroom by this rate (there is not room in these spaces for baseboard) we find that 26.7 and 10.9 sq ft respectively are needed. From Table 4 radiators may be selected to make up this footage. It is necessary in selecting baseboard lengths to leave space for expansion, piping and end cover boxes for valves.

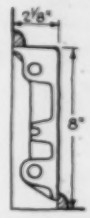
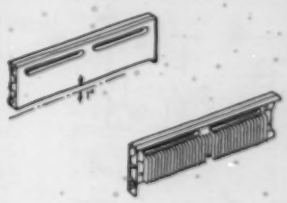
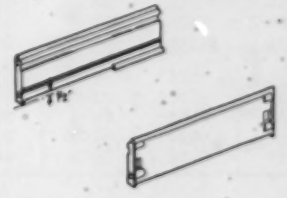
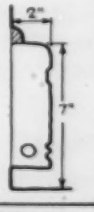
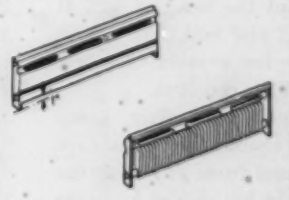
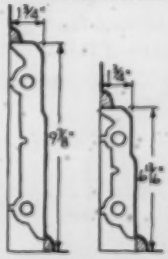
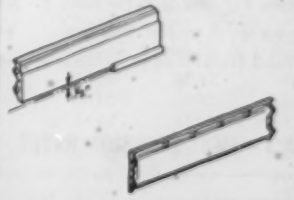
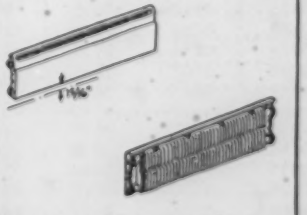
3. Select Boiler. A boiler with a net rating of 45,000 BTU per hr will be adequate for this system. Boilers are made large enough to supply the pick up, pipe loss and domestic hot water needs, unless these are unusual.

4. Select Air Cushion Tank. To facilitate expansion in the system, allow 1 gal of tank volume for each 30 sq ft of radiation. Dividing 222.9 sq ft by 30, the min volume usable is 7.4 and the next larger stock size tank will be selected.

5. Select Pump Size. Tables used are based on a temperature drop in the system of 20 F. Since this is the drop we have chosen, use Table 9 to select a pump size. Since our heat loss is below 50,000 BTU per hr, a 1 in. standard pump is acceptable. The head developed by the pump in supplying water to make up the heat loss at the given temperature drop may be found from Table 10. For a 1 in. pump and nearly 50,000 BTU per hr, the head will be about 5.25 ft.

6. Determine Main Size. In determining the length of the system it is usual to allow 12 ft for each heating element in addition to the measured length of the main. The total of these

Table I - BASEBOARD HEATER UNITS

MFR. TYPE & I-B-R RATING	DIMENSIONS	VIEWS FRONT BACK	SQ. FT./FT. RATING
AMERICAN RADIATOR R LOW 1.25			1.25
AMERICAN RADIATOR RC LOW 2.08			2.08
BURNHAM R LOW 1.25			1.25
BURNHAM RC LOW 2.08			2.08
CRANE R HIGH 1.77 LOW 1.25			HIGH 1.77 LOW 1.25
CRANE RC HIGH 2.92			2.92

I-B-R means Institute of Boiler and Radiator Mfgrs. Col. 4 in table gives manufacturers' ratings.

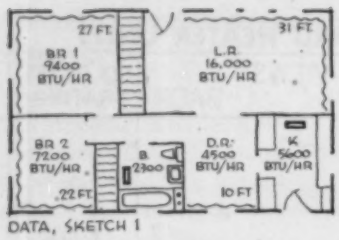
(*Continued on page 122*)

HEATING SYSTEMS FOR HOUSES

(Continued from page 121)

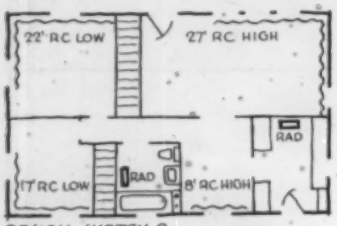
Cast Iron Baseboard Heating Systems: 3 — Design

By William J. McGuinness



DATA, SKETCH 1

Heat loss and outside wall length



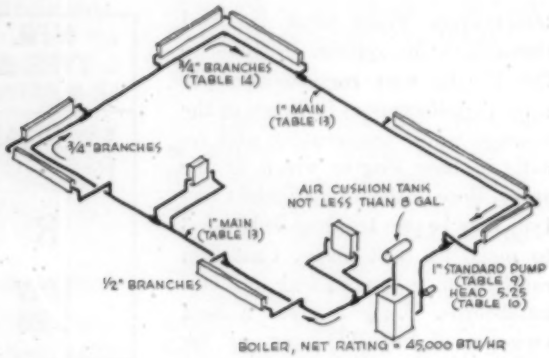
DESIGN, SKETCH 2

Length and type of baseboard

Temp. drop of water in system 20°

Length of System:

Measured length of main	130
Radiator allowance	
16 heating elements x 12l	72
(Use 200' in Table 11l	202


¾" BRANCHES (TABLE 14)
1" MAIN (TABLE 13)
¾" BRANCHES
AIR CUSHION TANK NOT LESS THAN 8 GAL.
1" MAIN (TABLE 13)
½" BRANCHES
1" STANDARD PUMP (TABLE 9) HEAD 5.25 (TABLE 10)
BOILER, NET RATING = 45,000 BTU/HR

DESIGN OF A RADIANT BASEBOARD HEATING SYSTEM USING ONE-PIPE FORCED HOT WATER

Table 2

DATA, SKETCH 1				DESIGN, SKETCH 2		
1 SPACE	2 BTU/HR HEAT LOSS	3 LINEAR FT. OF EXTERIOR WALL AVAILABLE	4 BTU/LIN. FT. OF EXTERIOR WALL	5 TYPE AND HT. OF BASEB'D SELECTED	6 LENGTH OF BASE TO BE USED	7 SQ. FT. OF RADIATION
L.R.	16,000	31	515	RC HIGH	27'	78.8
D.R.	4,500	10	450	RC HIGH	8'	23.3
K.	5,600	NONE, USE RADIATOR	—	RADIATOR	22"-4T-16SC	28.8
BR 1	9,400	27	347	RC LOW	22'	45.8
BR 2	7,200	22	327	RC LOW	17'	35.4
BATH	2,300	NONE, USE RADIATOR	—	RADIATOR	22"-4T-6SC	10.8
TOTALS	45,000					222.9

for the example given is 202 ft. Using this length and the head of 5.25 ft enter Table 11 and find that 1 in. is the right size for a main that will supply the BTU's required.

7. Determine Branch Sizes. Using the lengths of the baseboards in each room, it is found from Table 12 that branches are to be ½ and ¾ in. as recorded on the final piping diagram. Size of branches for small-tube cast iron radiation as used in the kitchen and bath is found from Table I, Section B, ARCHITECTURAL RECORD, Nov. 1949, p. 157. Using the total heat loss of 45,000 BTU per hr and main size of 1 in., ½ in. branch size is satisfactory for each of the radiators.

References

For larger jobs, the reader is referred to: IBR Installation Guide No. 5, *Baseboard Heating Systems* of the Institute of Boiler and Radiator Mfgrs. (60 E. 42nd St., New York 17, N. Y., 50 cents) through whose courtesy the tables have been partially reproduced here; *A Study of Radiant Baseboard Heating in the IBR Research Home* by Alonzo P. Kratz and Warren S. Harris, Engineering Experiment Station Bulletin Series No. 358, Univ. of Illinois, Urbana, Ill., 35 cents; *Heating a Basementless House With Radiant Baseboard* by R. H. Weigel and W. S. Harris, article in Heating Piping and Air Conditioning, Nov., 1948.

Table 3 — HEAT EMISSION RATES

AVERAGE RADIATOR TEMPERATURE	BTU/HR PER SQ FT
170	150
175	160
180	170
185	180
190	190
195	200
200	210
205	220
210	230
215	240

Table 4 — SMALL TUBE CAST IRON RADIATORS

NO. OF SQ FT OF CAST IRON RADIATION PER SECTION (STANDARD SPACING 1¾")		
NO. OF TUBES PER SECTION	HEIGHT	SQ FT OF RADIATION PER SECTION
3	25	1.6
4	19	1.6
	22	1.8
	25	2.0
5	22	2.1
	25	2.4
6	19	2.3
	25	3.0
	32	3.7

HEATING SYSTEMS FOR HOUSES

(Continued on page 127)

Cast Iron Baseboard Heating Systems: 4 — Baseboard Rating Tables

By William J. McGuinness

Table 5 — TYPE R — LOW HEIGHT

Length of Assembly Ft	Rating Sq Ft*	Rating, Btu/Hr., at Various Average Water Temperatures									
		215 F	210 F	205 F	200 F	195 F	190 F	185 F	180 F	175 F	170 F
2	2.5	600	570	520	510	490	460	440	410	390	360
3	3.75	900	850	810	770	730	690	660	620	580	550
4	5.0	1200	1140	1080	1030	980	920	870	820	770	730
5	6.25	1500	1420	1360	1290	1220	1160	1090	1030	970	910
6	7.5	1800	1710	1630	1540	1470	1390	1310	1240	1160	1090
7	8.75	2100	1990	1900	1800	1710	1620	1530	1440	1360	1280
8	10.0	2400	2280	2170	2060	1960	1850	1750	1650	1550	1460
9	11.25	2700	2560	2440	2320	2200	2080	1970	1860	1740	1640
10	12.5	3000	2850	2710	2570	2450	2310	2190	2060	1940	1820
11	13.75	3300	3130	2980	2830	2690	2540	2410	2270	2130	2010
12	15.0	3600	3420	3250	3090	2940	2770	2620	2470	2320	2190
13	16.25	3900	3700	3530	3350	3180	3010	2840	2680	2520	2370
14	17.5	4200	3990	3800	3600	3430	3240	3060	2890	2710	2550
15	18.75	4500	4270	4070	3860	3670	3470	3280	3090	2910	2740
16	20.0	4800	4560	4340	4120	3920	3700	3500	3300	3100	2920
17	21.25	5100	4840	4610	4380	4160	3930	3720	3510	3290	3100
18	22.5	5400	5130	4880	4630	4410	4160	3940	3710	3490	3280
19	23.75	5700	5410	5150	4890	4650	4390	4160	3920	3680	3470
20	25.0	6000	5700	5420	5150	4900	4620	4370	4120	3870	3650
21	26.25	6300	5980	5700	5410	5140	4860	4590	4330	4070	3830
22	27.5	6600	6270	5970	5660	5390	5090	4810	4540	4260	4010
23	28.75	6900	6550	6240	5920	5630	5320	5030	4740	4460	4200
24	30.0	7200	6840	6510	6180	5880	5550	5250	4950	4650	4380
25	31.25	7500	7120	6780	6440	6120	5780	5470	5160	4840	4560
26	32.5	7800	7410	7050	6690	6370	6010	5690	5360	5040	4740
27	33.75	8100	7690	7320	6950	6610	6240	5910	5570	5230	4930
28	35.0	8400	7980	7590	7210	6860	6470	6120	5770	5420	5110
29	36.25	8700	8260	7870	7470	7100	6710	6340	5980	5620	5290
30	37.5	9000	8550	8140	7720	7350	6940	6560	6190	5810	5470

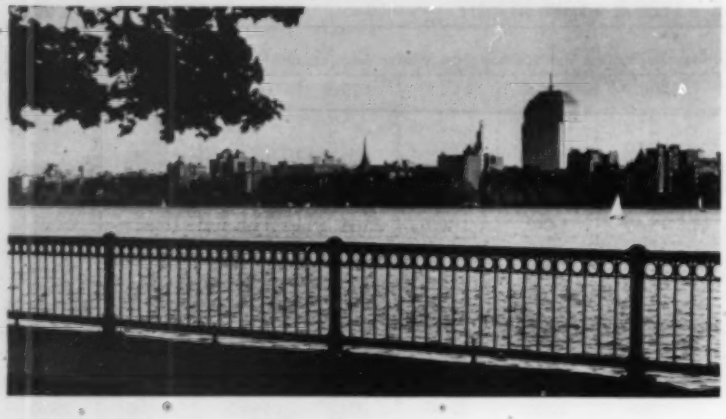
Table 6 — TYPE R — HIGH HEIGHT

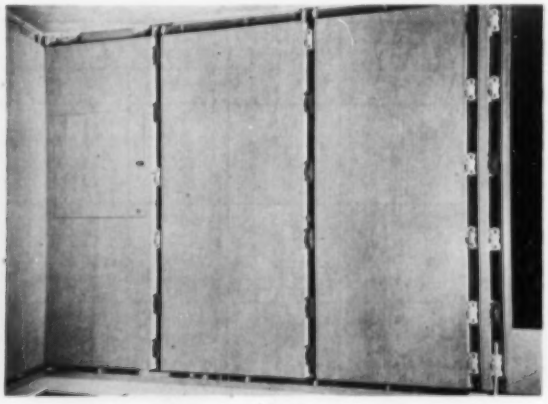
Length of Assembly Ft	Rating Sq Ft*	Rating, Btu/Hr., at Various Average Water Temperatures									
		215 F	210 F	205 F	200 F	195 F	190 F	185 F	180 F	175 F	170 F
2	3.5	850	810	770	730	690	650	620	580	550	520
3	5.3	1270	1210	1150	1090	1040	980	930	870	820	770
4	7.1	1700	1610	1540	1460	1390	1310	1240	1170	1100	1030
5	8.8	2120	2010	1920	1820	1730	1630	1550	1460	1370	1290
6	10.6	2550	2420	2310	2190	2080	1970	1860	1750	1650	1550
7	12.4	2970	2820	2680	2550	2420	2290	2170	2040	1920	1810
8	14.2	3400	3230	3070	2920	2780	2620	2480	2340	2200	2070
9	15.9	3820	3630	3450	3280	3120	2940	2780	2630	2470	2320
10	17.7	4250	4040	3840	3650	3470	3280	3100	2920	2740	2580
11	19.5	4670	4440	4220	4010	3810	3600	3400	3210	3020	2840
12	21.25	5100	4840	4610	4380	4160	3930	3720	3510	3290	3100
13	23.0	5520	5240	4990	4740	4510	4250	4020	3790	3560	3360
14	24.8	5950	5650	5380	5110	4860	4590	4340	4090	3840	3620
15	26.5	6370	6050	5760	5470	5200	4910	4640	4380	4110	3870
16	28.3	6800	6460	6150	5840	5550	5240	4960	4670	4390	4140
17	30.1	7220	6860	6530	6200	5900	5560	5260	4960	4660	4390
18	31.9	7650	7270	6920	6570	6250	5900	5580	5260	4940	4650
19	33.6	8070	7670	7300	6930	6590	6220	5880	5550	5210	4910
20	35.4	8500	8070	7680	7300	6940	6550	6200	5840	5490	5170
21	37.2	8920	8470	8060	7660	7280	6880	6500	6130	5760	5430
22	39.0	9350	8880	8450	8020	7640	7210	6820	6430	6040	5690
23	40.7	9770	9280	8830	8390	8000	7530	7120	6720	6310	5940
24	42.5	10200	9690	9220	8750	8330	7860	7440	7010	6590	6200
25	44.25	10620	10090	9600	9110	8670	8190	7740	7300	6860	6460
26	46.0	11050	10500	9990	9480	9020	8520	8060	7600	7140	6720
27	47.8	11470	10900	10370	9840	9370	8840	8360	7890	7410	6980
28	49.6	11900	11300	10760	10210	9720	9170	8680	8180	7690	7240
29	51.3	12320	11700	11140	10570	10060	9500	8980	8470	7960	7490
30	53.1	12750	12110	11530	10940	10400	9830	9300	8770	8230	7760

* Based on the common standard emission rate of 240 Btu per hour per sq ft at 215 F.

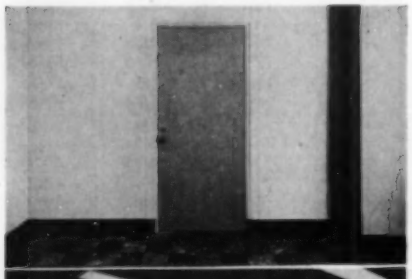
PRODUCTS for Better Building

George M. Cushing, Jr., Photos





An important design consideration in Boston's new John Hancock Building was the requirement of complete flexibility of office space. Re-usable metal partitioning, along with continuous suspended ceilings, was the solution of Cram & Ferguson, Architects



MILES OF RE-USABLE METAL PARTITIONING TO REDUCE COSTS IN JOHN HANCOCK

Throughout the John Hancock Building, as stated in the November 1949 ARCHITECTURAL RECORD, full performance and easy maintenance were paramount design criteria. In a building containing, as this one does, over 630,000 sq ft of office space, ease in rearranging office partitions is fundamental. To keep maintenance costs down, even the interior surfacing of exterior walls is preferably easily demounted, so that wiring, controls, and heating and air conditioning ducts can be reached quickly; all interior surfaces have to be easy to clean.

Hauserman Movable Steel Partitions and Wainscoting were used in offices, lounges, etc., on 23 floors of the building. Though not brand-new products, their use on such a scale is noteworthy. Finish of the panels is baked-on enamel designed to withstand commercial cleaning solvents for years, although wiping with a damp cloth is all that is normally expected here. Numerous colors, wood graining, etc., of finish are available. Materials are totally incombustible, and the noise-deterring panels contain built-in electrical raceways.

The flush, acoustic-tile ceilings used are essential if full benefits of easy removal and replacement of walls are to be realized: an important adjunct of Hauserman Movable Steel Interiors is Hauserman *Acoustical Steel Pan Ceilings*. Flexibility and maintenance are equally important in small business buildings; see this month's Building Types Study.

Packaged Flooring

Laytile packaged flooring, a new idea in merchandising hardwood flooring, furnishes assorted short lengths of matched hardwood sufficient to cover 10 sq ft. The flooring is put up in sealed cardboard cartons marked with contents, grade, scale and exact cost. Sized for easy handling, the cartons are said to keep the wood clean and dry and the moisture content more uniform. Labor saving is reported in figuring additions for matching and computing the cost for a given floor area. The Connor Lumber and Land Co., P. O. Box 112X, Marshfield, Wis.

Window Shades

The *Draper X-L Window Shading Unit* incorporates several shades mounted on a special roller bracket for shading or darkening rooms with wide or multiple windows or glass block areas. It was designed to eliminate the use of extremely wide shades in schools, offices, etc.

The unit is made to order with any number of shades and in any width. The mounting consists of a steel angle

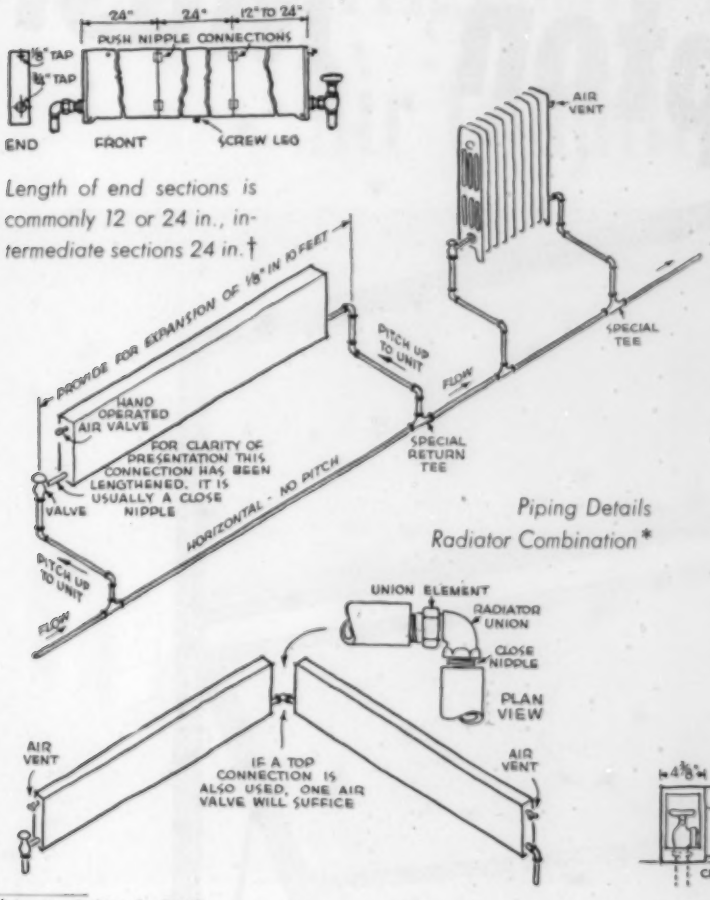
(*Continued on page 160*)

HEATING SYSTEMS FOR HOUSES

(Continued from page 127)

Cast Iron Baseboard Heating Systems: 6 — Design Details

By William J. McGuinness



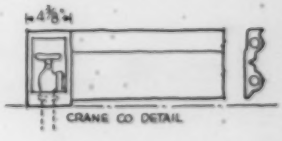
Length of end sections is commonly 12 or 24 in., intermediate sections 24 in.†

Piping Details
Radiator Combination *

A. Air Seal. *Building paper, aluminum foil or asbestos paper must be placed behind base heaters to prevent streaks on wall. It is turned down under top moulding*

B. Insulation. *Full insulation is advisable to reduce heat loss and shorten base length. Use of batts behind base is necessary.*

C. Recessing. *Bulk of base may be reduced by recessing in amount of plaster thickness. Base must be backed by a 1/8 in. board*



Valve enclosure lengths:
American Radiator—6¾ in.
Burnham —5 in.
Crane —4⅜ in.

* American Radiator Co. Details

Table 9 - TRIAL PUMP SIZE

Total Load on System Btu/Hr.	Standard Pump
Up to 50,000	1"
50,001 to 100,000	1¼"
100,001 to 150,000	1½"
Over 150,001	1½"

Table 10 - PRESSURE HEAD DEVELOPED BY PUMP

Note: This Table is based on conservative averages. Consult manufacturers' data for closer accuracy.

Total Load Btu/Hr.	PRESSURE HEAD IN FT. OF WATER — Standard Pump		
	1"	1¼"	1½"
25,000	5.50	6.25	6.75
50,000	5.25	6.00	6.75
75,000	4.75	5.75	6.50
100,000	4.50	5.50	6.50
125,000	4.00	5.25	6.25

Table 12 - BRANCH SIZES FOR BASEBOARDS

Based on the use of one-pipe fittings in the main

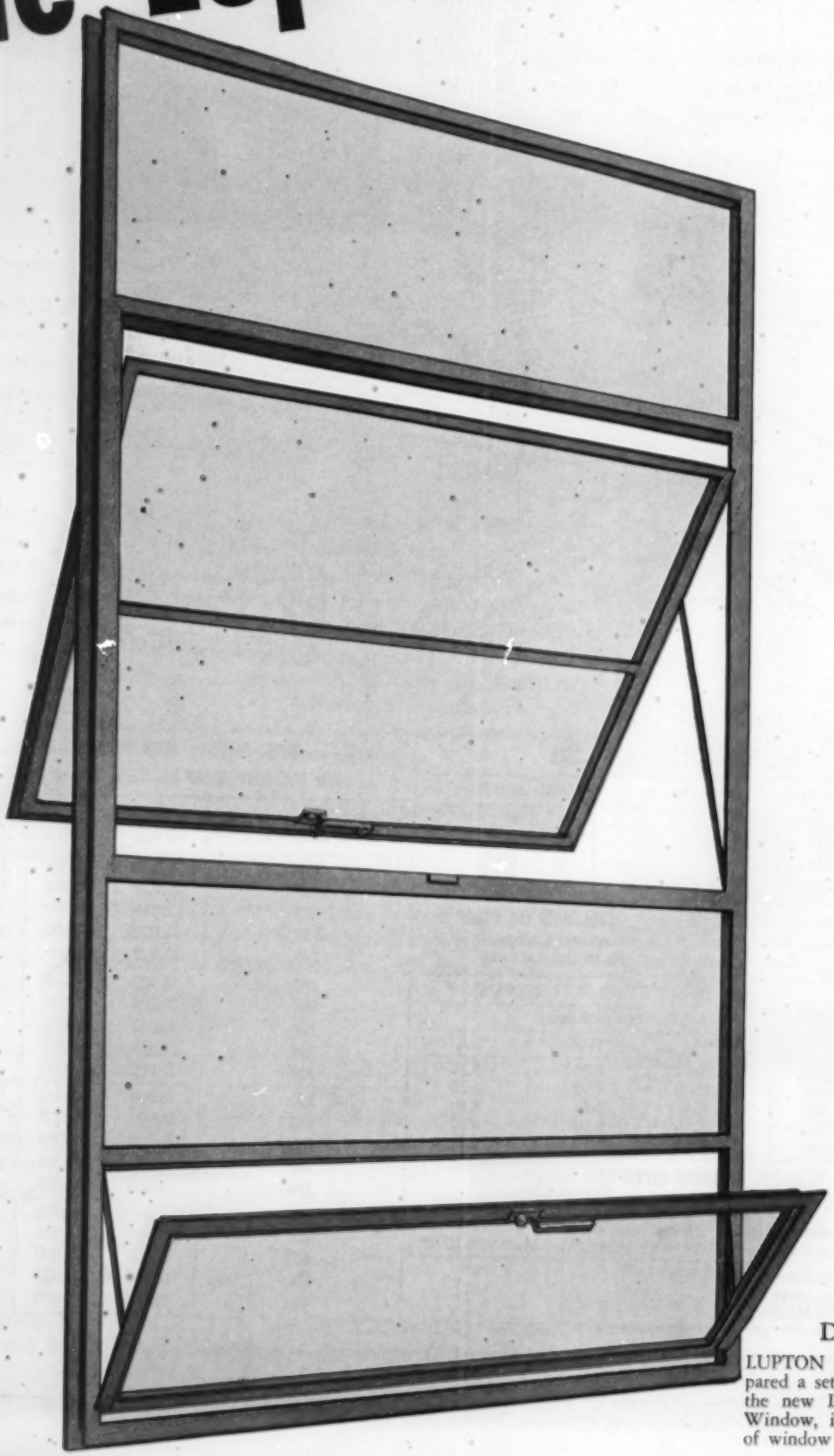
Location of Baseboard	If Baseboard is 10 ft. or less in Length	If Baseboard is Longer than 10 ft.†
1st Floor Below Main	¾"	¾"
1st Floor Above Main	½"	¾"
2nd Floor Above Main	¾"	¾"

Table 11 - MAIN SIZES — IRON PIPE OR TYPE L COPPER TUBE
FOR PRESSURE HEADS BETWEEN 4.8 and 6.7 FT. OF WATER

Measured Length plus radiator allowance, Ft.	Capacity in Btu/Hr. — ¾" Pipe	1" Pipe	1¼" Pipe	1½" Pipe
100	34,000	64,000	116,000	176,000
110	33,000	63,000	113,000	172,000
120	32,000	61,000	110,000	168,000
130	31,000	60,000	107,000	164,000
140	30,000	58,000	104,000	160,000
150	30,000	56,000	101,000	156,000
160	29,000	54,000	99,000	153,000
170	28,000	53,000	98,000	150,000
180	27,000	52,000	96,000	147,000
190	27,000	51,000	94,000	144,000
200	26,000	50,000	92,000	141,000
210	25,000	49,000	90,000	139,000
220	25,000	48,000	89,000	136,000
230	24,000	47,000	87,000	134,000
240	24,000	46,000	86,000	132,000
250	24,000	45,000	84,000	130,000
300	21,000	41,000	78,000	120,000
400	19,000	36,000	68,000	105,000
500	16,000	33,000	62,000	95,000
600	15,000	30,000	56,000	88,000

† It is recommended that not more than 40 lin ft. of baseboard be connected to the main with a single supply and return riser.

ANNOUNCING
The Lupton "Master"

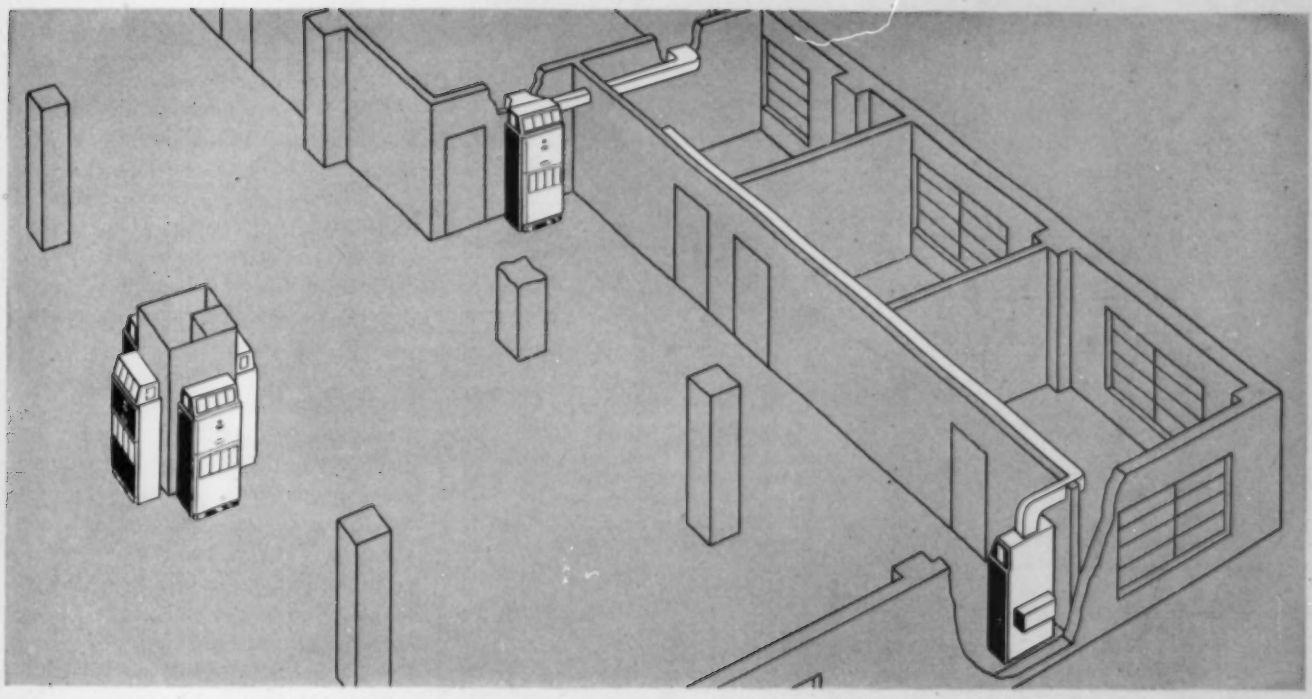


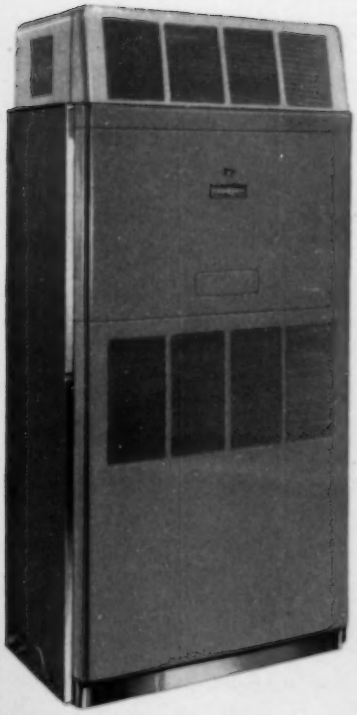
DATA SHEETS

LUPTON window engineers have p
pared a set of practical Data Sheet
the new Lupton "Master" Alumi
Window, including full size draw
of window sections. Write for your

Here's the low-cost way to air condition existing buildings — large or small —

Specify Frigidaire Multiple-Unit Air Conditioning!





Yes, Frigidaire Multiple-Unit Air Conditioning is the low-cost way to handle existing buildings — and new buildings, too — because it's the fastest, simplest way you can find! *Installation* costs are low, for little duct work is needed — no major building alteration. And *operating* costs are equally low, for individual Frigidaire units automatically turn off or on as needed — can be serviced without affecting other space.

For further information about Frigidaire Multiple-Unit Air Conditioning, fill out and mail the coupon below. Or call your dependable Frigidaire Dealer. He'll be glad to give you full details about this type of conditioning, as well as Frigidaire Room Conditioners and Frigidaire Central Systems. You'll find his name in your Classified Phone Directory, under "Air Conditioning" or "Refrigeration Equipment."

Compact, good-looking Frigidaire Self-Contained Air Conditioners are styled by Raymond Loewy, designed and built by Frigidaire in capacities of 3 and 5 tons.

Over 400 Frigidaire commercial refrigeration and air conditioning products — most complete line in the industry.

Frigidaire Division of General Motors
1416 Amelia Street, Dayton 1, Ohio
(In Canada, Leaside 12, Ontario)

Please have your representative contact me regarding Frigidaire Multiple-Unit Air Conditioning installations for:

☐ Existing Building ☐ New Construction

Name ..... ☐ Architect

Firm Name ..... ☐ Builder

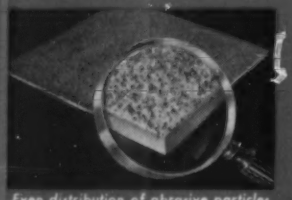
Street ..... *City* ..... ☐ Owner

County ..... *State* ..... ☐ .....

NOW! END SLIPPING ACCIDENTS WITH A.W. ALGRIP

(POSITIVE NON-SLIP FLOOR PLATE)

Non-slip—Even on Steep Inclines



Even distribution of abrasive particles shown by magnifying glass.

Prevents slipping on factory floors, walkways, etc.

Protects workmen and vehicles from slipping on ramps and loading platforms.

REVOLUTIONARY, NEW ABRASIVE ROLLED STEEL FLOOR PLATE

Now, for the first time you can prevent dangerous, expensive slipping accidents with A.W. ALGRIP ABRASIVE *Rolled Steel* Floor Plate. It's the non-slip floor plate that safety engineers, architects, purchasing agents and plant owners have always wanted.

A.W. ALGRIP is made by rolling abrasive grain as an integral part of the upper portion of *steel* plate. It retains its non-slip qualities for a lifetime, because as the surface wears new abrasive particles are constantly exposed.

Install A.W. ALGRIP for positive non-slip protection in all areas subjected to oil, grease or water, on which men walk or climb . . . loading platforms, ramps, washroom floors, fire escapes, running boards and similar surfaces. A.W. ALGRIP prevents slipping even on steep inclines. And remember it's low in cost, easy to install, requires no maintenance, and is resistant to heat, fire and heavy traffic.

Write or use coupon for complete information about this amazing, new, non-slip floor plate now.

A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

A Product of **ALAN WOOD STEEL COMPANY**

Conshohocken 20, Penna.

Gentlemen: *Please rush me complete information about A.W. ALGRIP*

*Name*_____ *Title*_____

*Company*_____ *Street Address*_____

*City*_____ *State*_____

Other Products: PERMACLAD Stainless Clad Steel • A.W. SUPER-DIAMOND Floor Plate • Billets • Plates • Sheets • Strip • (Alloy and Special Grades)

NEW NEW NEW

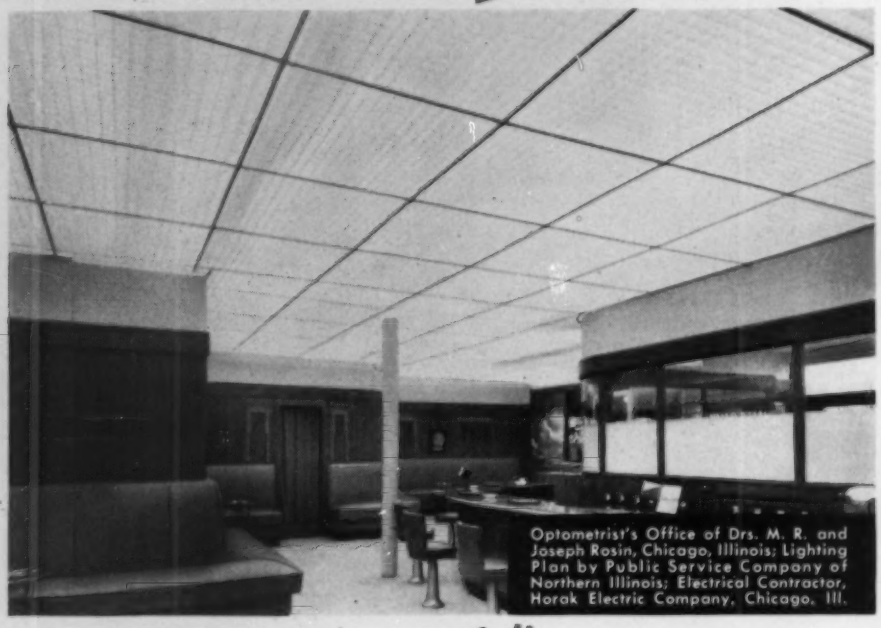
Lewis Eugene Wilson, *Architect*

MODERN DOOR CONTROL BY *LCN* · CLOSERS CONCEALED IN HEAD FRAME

BALDWIN THEATRE, LOS ANGELES, CALIFORNIA

LCN CATALOG 11-E ON REQUEST OR SEE SWEET'S • LCN CLOSERS, INC., 466 WEST SUPERIOR STREET, CHICAGO 10

NOW! entire ceilings *Glow* with light!



Optometrist's Office of Drs. M. R. and Joseph Rosin, Chicago, Illinois; Lighting Plan by Public Service Company of Northern Illinois; Electrical Contractor, Horak Electric Company, Chicago, Ill.

INCOMPARABLE "Sky-Glo" CREATES A NEW EXPERIENCE IN SEEING!

Indescribably wonderful is seeing under the soft, restful and exhilarating "Sky-Glo" luminous ceiling lighting! Now it is possible to obtain much higher levels of illumination without annoying brightness or eye-tiring glare!

LUMINOUS VINYLITE LOUVERS MAKE UNBELIEVABLE DIFFERENCE

You must experience "Sky-Glo" lighting to truly appreciate the great advance it represents in lighting! For here is lighting that achieves high levels of illumination from 50 to 150 footcandles . . . yet is so unobtrusive that one is neither consciously aware of increased light nor its source.

The secret is in the louvers! "Sky-Glo" is the first to use a plastic (Vinylite) that not only reflects light but transmits it, too! The special qualities of this louver diffuse and soften the light to produce a new experience in seeing.

MOST BEAUTIFUL LIGHTING

Incomparable, too, is the beauty of "Sky-Glo"! Gone are the forest of fixtures which are now concealed by a new kind of "Ceiling of Light" created by "Sky-Glo". Now, the lighting in new buildings can be as beautiful and modern as the exteriors!

SAVES ALTERATIONS

Now, instead of spending for expensive ceiling alterations install a "Sky-Glo" system that converts old ceilings into glowing new ones at lower cost than ever before.

FREE ILLUSTRATED FOLDER

Gives complete information on this new, modern lighting system consisting of standardized parts of channels, fittings and translucent Vinylite panels that can be fitted to practically any size and shape of ceiling.

BENJAMIN "Sky-Glo"
LUMINOUS LOUVERED LIGHTING SYSTEM

Distributed Exclusively Through Electrical Wholesalers

Benjamin Electric Mfg. Co.
Dept. Q-1, Des Plaines, Ill.

Gentlemen: Without cost or obligation please send complete data on "Sky-Glo" to:

Name.....

Company.....

Address.....

City..... State.....

3115R

Ask Your Electrical Contractor to Submit a Specific Proposal

THE RECORD REPORTS

CANADA

(Continued from page 136)

urban Weston, Toronto, Ont., by F. G. Engholm, president of the Macotta Co. of Canada, architect and owner.

Steel studs for exterior walls were made in prefabricated sections 10 ft long, packed with rock wool insulation.

Prefabricated roof trusses are wood, and sheathing is plywood, jointed with mastic and cotton membrane and covered with an asphaltic compound used for undercoating cars. Colored slate granules were blown on the compound, fusing with it to give an entirely unbroken surface.

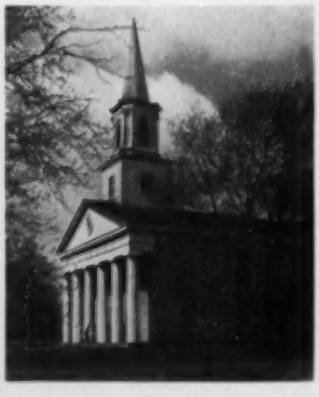
Radiant heating coils are laid in concrete slab floor; the attic houses an air conditioning unit.

R. A. I. C. Plans Program

Two seminars, one technical and one cultural, are among features of the program for the 43rd annual assembly of the Royal Architectural Institute of Canada, scheduled for February 23–25 in the Fort Garry Hotel, Winnipeg, Man.

Also featured will be a report by Robert F. Leggett, head of the Building Research Division of the National Research Council.

St. Andrew's Presbyterian Church (architect unknown), Niagara-on-the-Lake, Ont., is among the subjects of a 22-panel photographic exhibit, "The Pictorial Essay of a Pioneer Town," touring the Dominion



(Continued on page 140)

modern *Personalized* heating for modern apartments

IN AKRON

PARKVIEW APARTMENTS, South Hawkins Ave.
The Hendrich Hall Harter Company, Builders and Operators

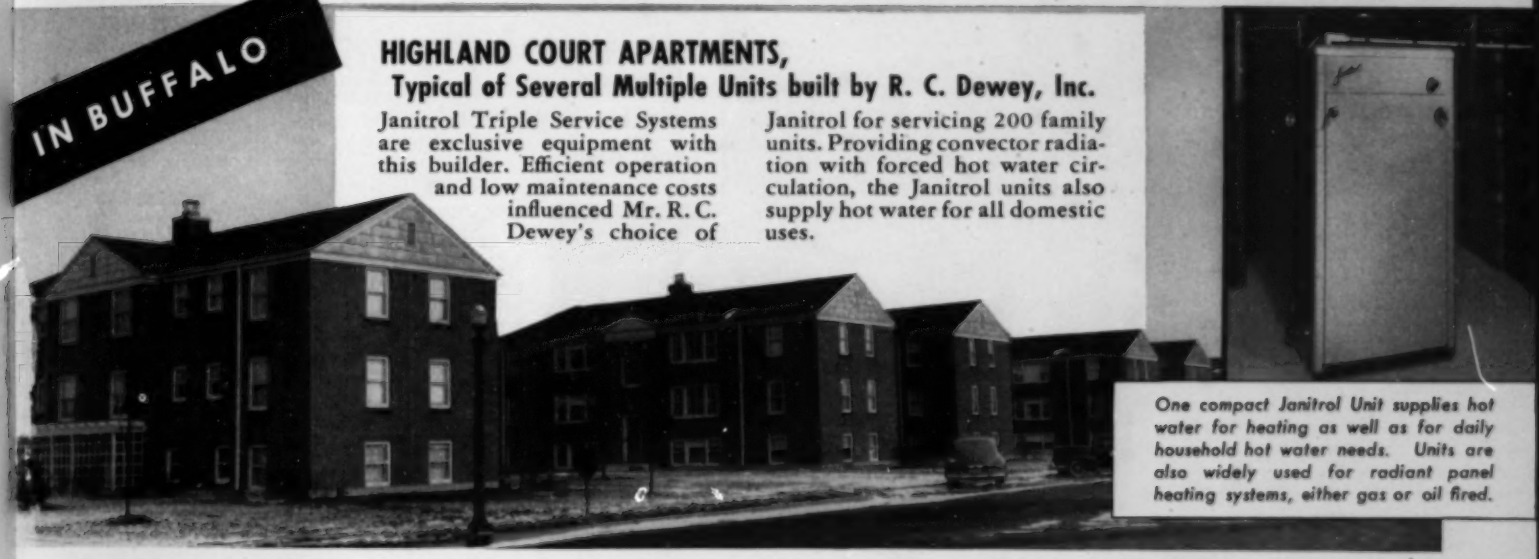
Photograph shows part of Parkview Manor consisting of 17 buildings housing 98 suites. Last word in modern conveniences, individual Gas-Fired Janitrol Winter Air Conditioners provide personalized heating for each family unit.

Basement installations of Janitrol units are extremely compact, clean and easily accessible. Same type units are often installed in closets or hallways immediately adjacent to individual apartments.

IN BUFFALO

HIGHLAND COURT APARTMENTS,
Typical of Several Multiple Units built by R. C. Dewey, Inc.

Janitrol Triple Service Systems are exclusive equipment with this builder. Efficient operation and low maintenance costs influenced Mr. R. C. Dewey's choice of Janitrol for servicing 200 family units. Providing convector radiation with forced hot water circulation, the Janitrol units also supply hot water for all domestic uses.

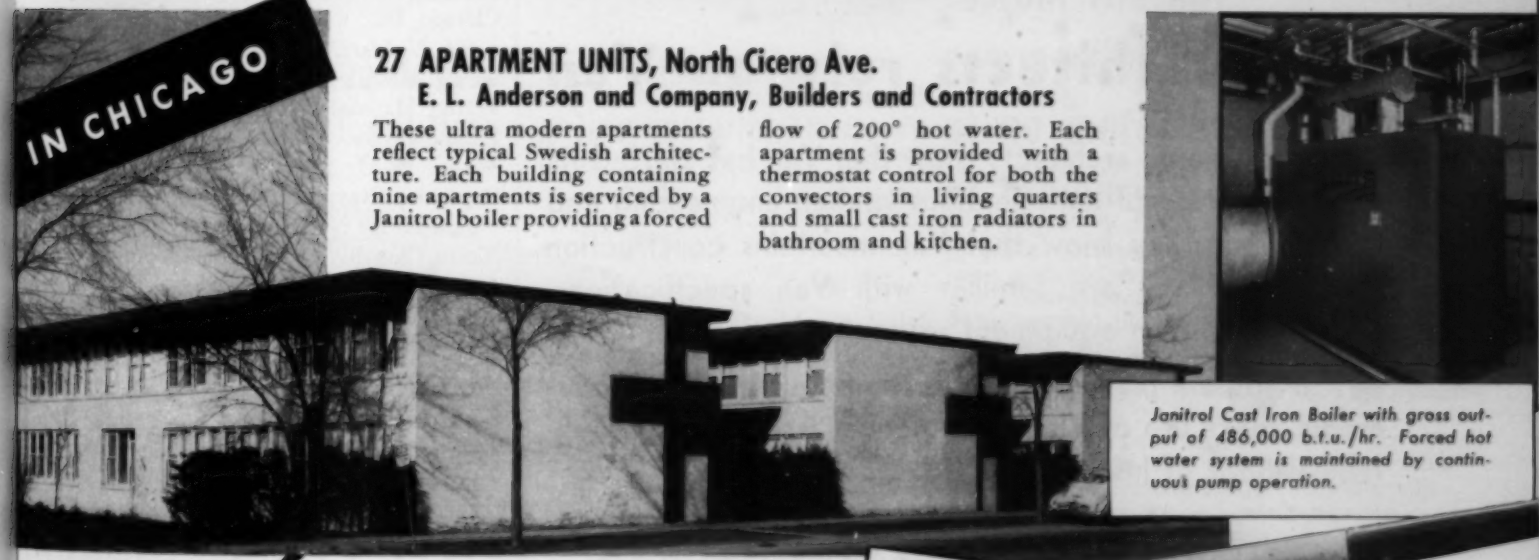


One compact Janitrol Unit supplies hot water for heating as well as for daily household hot water needs. Units are also widely used for radiant panel heating systems, either gas or oil fired.

IN CHICAGO

27 APARTMENT UNITS, North Cicero Ave.
E. L. Anderson and Company, Builders and Contractors

These ultra modern apartments reflect typical Swedish architecture. Each building containing nine apartments is serviced by a Janitrol boiler providing a forced flow of 200° hot water. Each apartment is provided with a thermostat control for both the convectors in living quarters and small cast iron radiators in bathroom and kitchen.



Janitrol Cast Iron Boiler with gross output of 486,000 b.t.u./hr. Forced hot water system is maintained by continuous pump operation.

ME-TESTED TIME-PROVEN

Janitrol

GAS FIRED WINTER AIR CONDITIONERS • UNIT HEATERS
GRAVITY FURNACES • BOILERS • GAS AND OIL FIRED
TRIPLE SERVICE HOT WATER SYSTEMS

Write today!

Complete specifications on typical Janitrol installations for apartments, industrial and commercial buildings and homes are available in A.I.A. file folders. Send for your copies today, there's no obligation, address—

Architectural Service
SURFACE COMBUSTION CORPORATION,
TOLEDO, OHIO

 (*Continued from page 138*)

Home Builders' Convention

Practical problems of home builders will occupy the spotlight throughout the sixth annual convention and exposition of the National Association of Home Builders in Chicago, Feb. 19–23.

Executive Vice President Frank W. Cortwright of Washington says the show will be "the most diversified we have ever attempted," and of immediate practical value to all builders there. E. M. Spiegel of Passaic, N. J. is chairman of the convention committee.

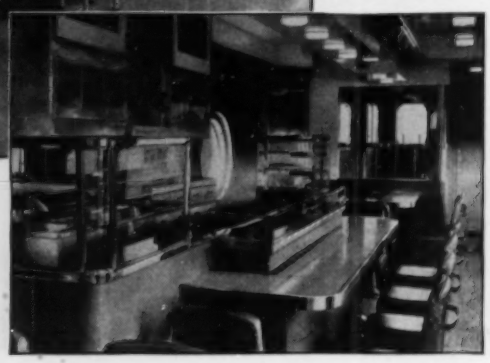
Competition Winners

Two students of the School of Architecture at Penn State College won first and second prizes in the Class B Problem I competition for design of a two-bedroom house conducted by the Beaux-Arts Institute of Design for the Architectural Record Prize awarded annually.

Taylor M. Potter won the first prize of $50 and Curtis C. Schafer the $25 award for his second-place design.

The problem, whose author was Sumner Spaulding, F.A.I.A., of Los Angeles, postulated a house for a family of four (maximum of 1200 sq ft floor space) on a site with 75 ft frontage and 100 ft deep. Integration of house and garden was stressed.

Six-lane cafeteria service in large machine tool plant



cocktails to coffee at counter on Congressional Limited

Why architects rely on Van

● Institutional architects know that Van has started its second century of conscientious kitchen engineering and fabrication. They know that Van maintains construction standards. They are familiar with Van specifications. They accept Van equipment without question.

● If you are planning food service equipment improvements, make use of Van's experience. Ask for Van's Centennial Book of Installations.

The John Van Range Co.

EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

DIVISION OF THE EDWARDS MANUFACTURING CO.

Branches in Principal Cities

429 CULVERT STREET CINCINNATI 2, OHIO

ON THE CALENDAR

Jan. 16–19: Plant Maintenance Show, sponsored by American Society of Mechanical Engineers and Society for Advancement of Management, Auditorium, Cleveland, Ohio.

Jan. 18–20: Annual meeting, American Society of Civil Engineers, Hotel Commodore, New York City.

Jan. 18–Mar. 5: Exhibition of Mies van der Rohe model, Museum of Modern Art, New York City.

Jan. 23–27: Southwest Air Conditioning Exposition of the International Heating and Ventilating Exposition, State Fair Park, Dallas, Texas.

Jan. 30–Feb. 3: 25th semi-annual Los Angeles Furniture Market, Los Angeles, Calif.

Feb. 19–23: Sixth Annual Convention and Exposition, National Assn. of Home Builders, Stevens and Congress Hotels, Chicago, Ill.

Feb. 27–Mar. 3: Committee Week and Spring Meeting, American Society for Testing Materials, Hotel William Penn, Pittsburgh, Pa.

Mar. 28–31: 1950 National Plastics Exposition, Navy Pier, Chicago, Ill.

Jan. 21–22: North American Conference on Church Architecture and Church Architect's Guild, joint meeting, Columbus, Ohio.

AT THE COLLEGES

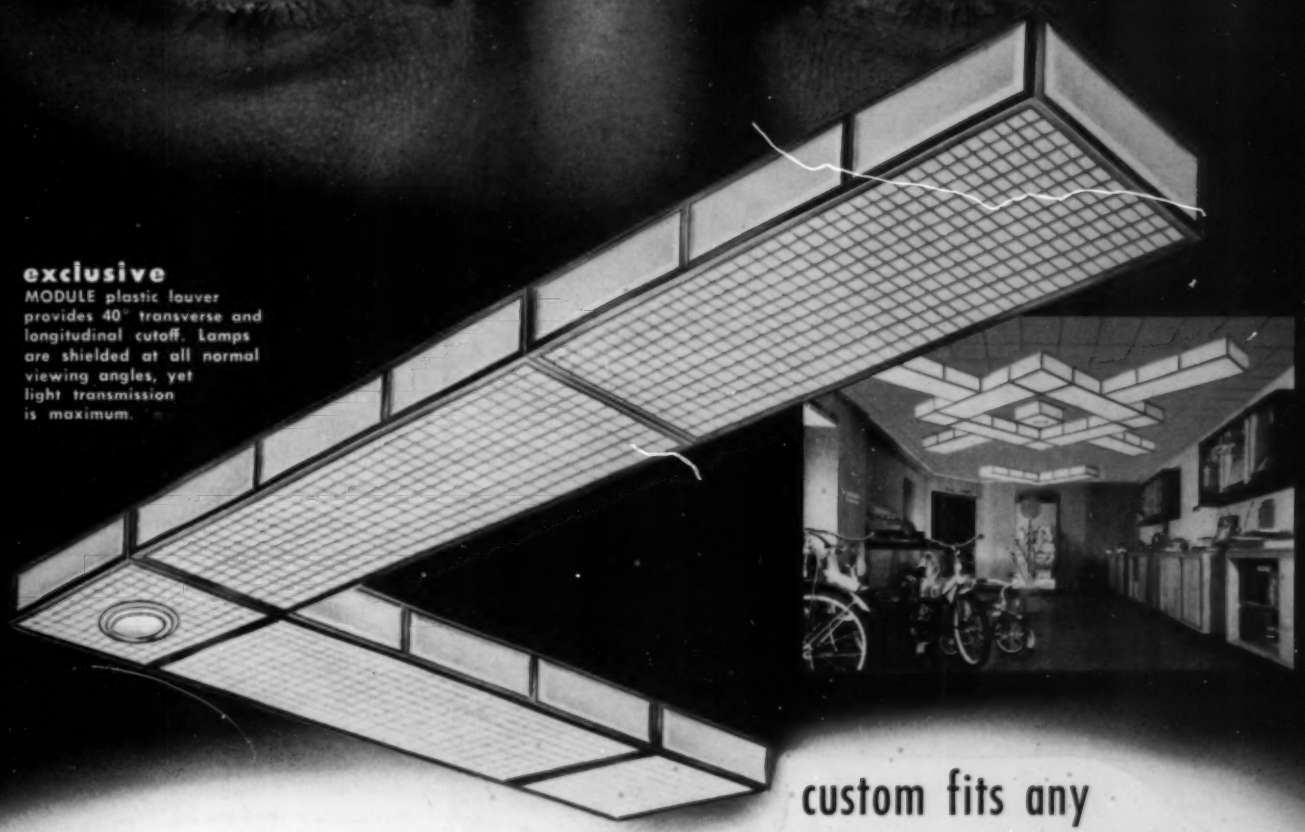
Faculty Appointments

• Dr. Thomas Hall Locraft, a member of the faculty of the Department of Architecture at Catholic University of America since his graduation from the University in 1926, has been appointed head of the Department. He succeeds Dr. Frederick Vernon Murphy, his partner in the Washington, D. C., firm of Murphy & Locraft, who retired from the Department last July.

(*Continued on page 142*)

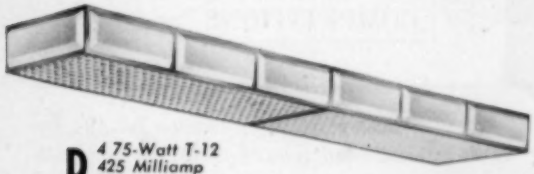
all eyes are on the *greatest*

Lighting Development since the fluorescent lamp

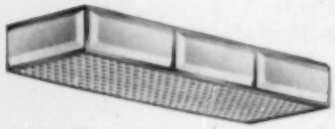


exclusive
MODULE plastic louver provides 40° transverse and longitudinal cutoff. Lamps are shielded at all normal viewing angles, yet light transmission is maximum.

these 4 low-cost modules are the "building blocks"
of a perfect custom-fitting lighting installation...

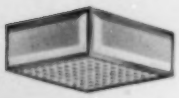


D 4 75-Watt T-12 425 Milliamp Slimline Lamps



C 4 40-Watt T-12 48" Type F Lamps

B 32-Watt 12" Circline Lamp, and 1 PAR Spot or Flood Lamp



A 4 14-Watt T-12 15" Type F Lamps

modules fit together perfectly end to side, end to end, side to side... to form more than 50,000 different lighting patterns...to fit any ceiling shape or size...mixing all light sources in one harmonious system... with equal brightness throughout (no dark sides or ends)...so you can put the light where it is needed!

MITCHELL **module**
REG U S PAT OFFICE

Only MITCHELL makes MODULE

custom fits any commercial interior— at no more than the cost of ordinary fixtures!

In just a few months, MITCHELL MODULE has won nation-wide approval and acceptance as an entirely new standard of commercial lighting. It is now being widely specified and installed in every type of commercial establishment—supported universally by lighting distributors, contractors, utility men and architects. The verdict of MODULE users is unanimous: "Here is complete lighting satisfaction!" Yes, here is the *first* and *only* lighting system that provides *all* the advantages of custom-fitted lighting at no more than the cost of ordinary fixtures...If you are not yet specifying MODULE, look into its superior possibilities—write for information today.

MITCHELL MANUFACTURING COMPANY
2525 N. Clybourn Ave., Chicago 14, Illinois
Send free 20-page brochure describing MODULE.

*Firm Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

*Attention:*_____

 (*Continued from page 140*)

• Lewis Mumford has returned as visiting professor of architecture for the second year at the North Carolina State College School of Design, which has also announced the appointment of Fred N. Severud as a visiting professor of architecture for 1949–50. Visiting lecturers for the current year whose appointments have been announced include Leo Katz, Eero Saarinen, William W. Caudill, Alonzo J. Harriman, Thomas Church, Buckminster Fuller, Richard J. Neutra and Frank Lloyd Wright.

• Reginald F. Malcolmson of Chicago, a graduate of the College of Technology, Belfast, Ireland, has been appointed instructor in architecture at Illinois Institute of Technology.

Award Announced

John H. VonGunten, a member of the Kansas State College architecture staff, is the winner of the 1949 John Stewardson $1400 memorial scholarship in architecture, Paul Weigen, department head, has announced.

Mr. VonGunten plans to travel and study from June through December of this year in France, Switzerland and Italy.

Product Design Featured

An engineering institute in industrial product design was held last month at the University of Wisconsin to demonstrate the various skills and techniques needed in the profession of industrial designing.

The institute was one of 18 sponsored by the university's College of Engineering and Extension Division. Prof. H. E. Pulver of the Extension Division is director.

New Scholarships Offered

Ten annual competitive scholarships of $1000 each in American colleges and technical schools have been authorized by the American Institute of Steel Construction. Initial awards will be made in 1950.

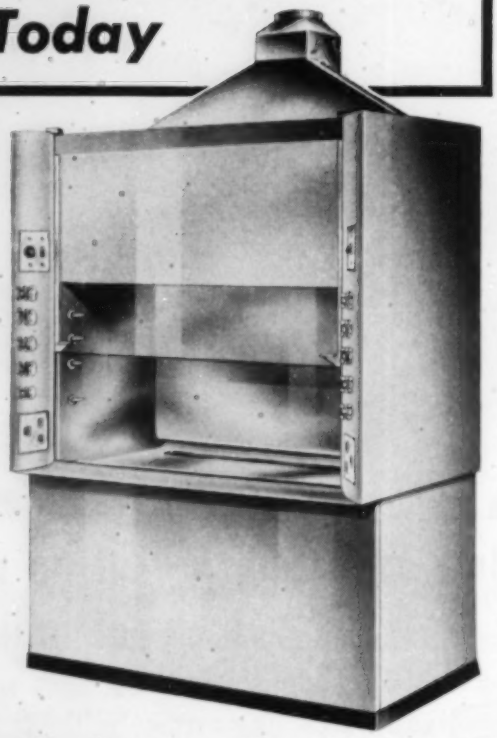
Objective of the scholarship plan is to train engineers and administrators for the fabricated structural steel industry, but recipients of scholarships will be under no obligation to continue in the industry after graduation.

Schools where the awards will be made will be announced later.

The FUME HOOD of the FUTURE . . is Yours Today

Kewaunee's New LOW VELOCITY FUME HOOD for Handling RADIO-ACTIVE ISOTOPES

Design Approved for Use by the OAK RIDGE INSTITUTE of NUCLEAR STUDIES



No. 3600—Kewaunee's "FUME HOOD of the FUTURE"

The Hood is made with stainless steel interiors and ducts throughout and incorporates a stainless steel working surface and trough. The working surface will support a load of 4,000 pounds. The Hood incorporates a new system of airfoils, baffles and ducts which provides a uniform flow of air over the entire face of the Hood, thus assuring evacuation of gases at extremely low velocities without interference from reverse eddies or turbulence. No auxiliary duplicate duct system for incoming air is required.

Write for Descriptive Literature and Drawings available now on Kewaunee No. 3600—"The Fume Hood of the Future"

Kewaunee Mfg. Co.
C. G. Campbell, *President*
5046 S. Center Street Adrian, Michigan
Representatives in Principal Cities

COMPETITIONS

International Award

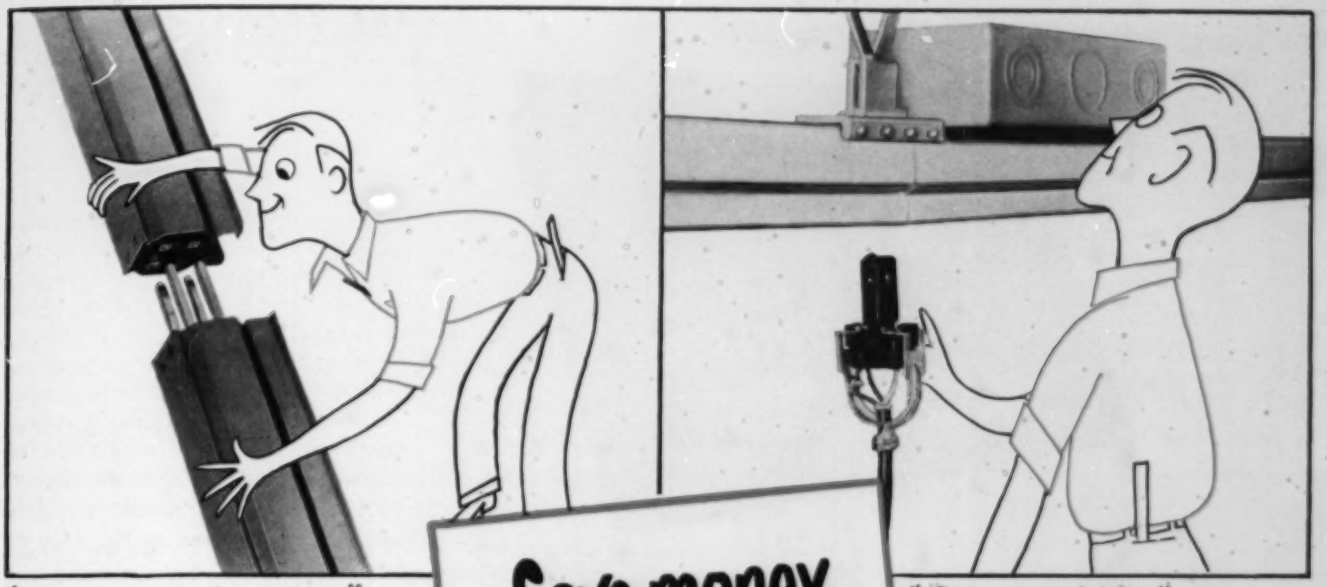
Closing date for entries for the International Award, 1949, of the Instituto Tecnico de la Construccion y del Cemento has been extended from Nov. 15, 1949 to Mar. 15, 1950.

Courthouse Design

Judgment in the competition on design of "A Court House Lobby" sponsored by the Marble Institute of America in conjunction with the Beaux Arts Institute of Design is scheduled for January 14.

Awards will be as follows: first prize, $100; second prize, $75; third prize, $50; fourth prize, $25.

(*Continued on page 144*)



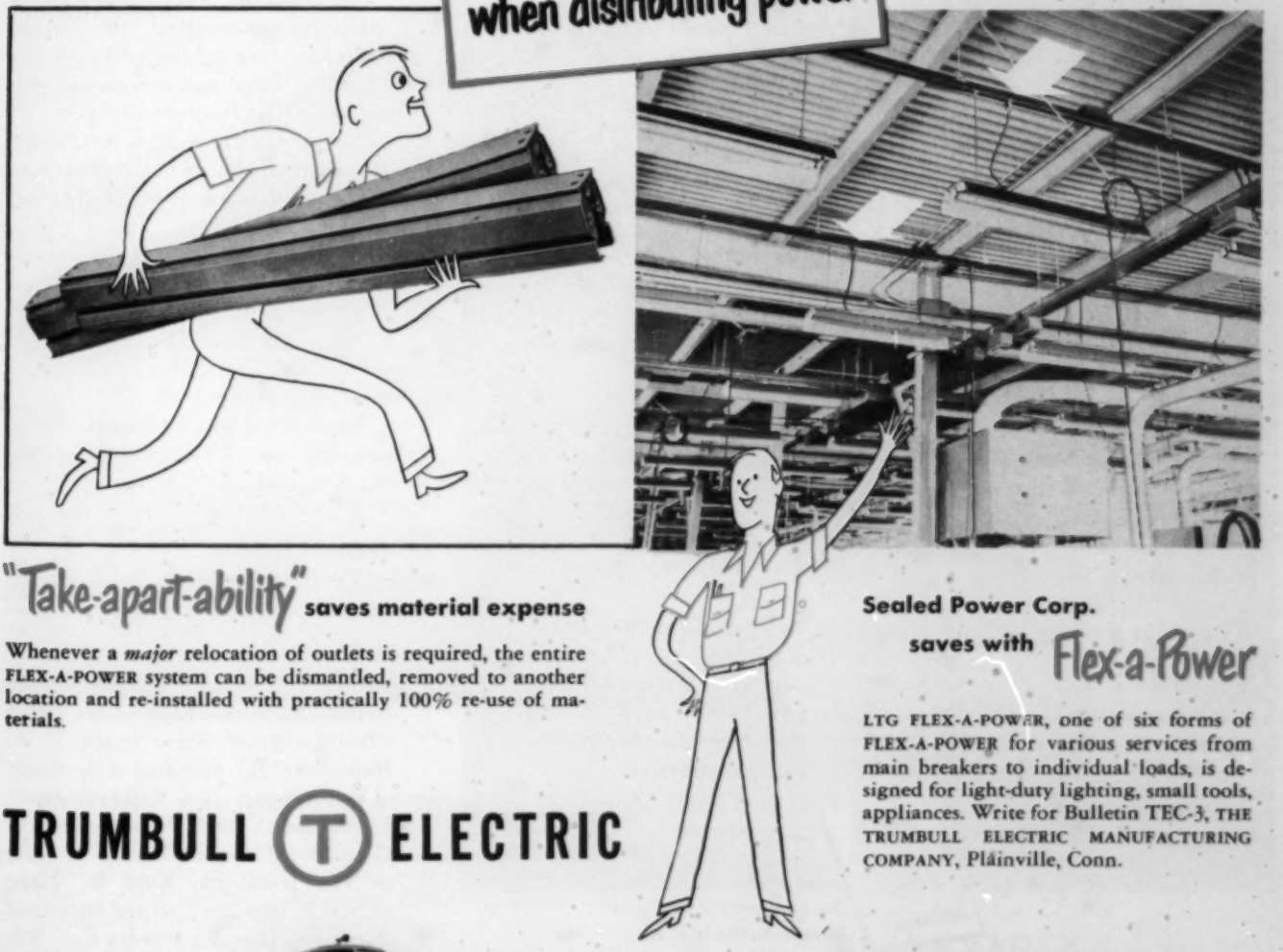
Save money these 3 ways when distributing power

"Quick-install-ability" saves initial cost

LTG FLEX-A-POWER busways are pre-fabricated housings which are easily coupled in any arrangement and in runs of any required length. Time for installing is much less than for wiring and conduit.

"Plug-in-ability" saves time relocating machines

Take-off plugs or trolley can be inserted anywhere (no drop-out section needed for trolley). You can add or relocate loads without rewiring expense and without long extensions.



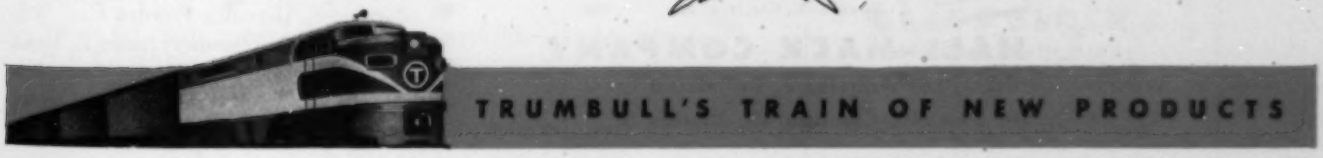
"Take-apart-ability" saves material expense

Whenever a *major* relocation of outlets is required, the entire FLEX-A-POWER system can be dismantled, removed to another location and re-installed with practically 100% re-use of materials.

Sealed Power Corp. saves with Flex-a-Power

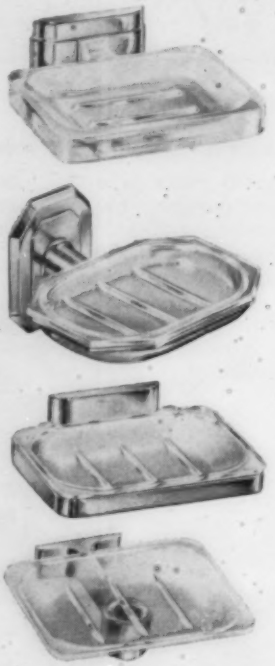
LTG FLEX-A-POWER, one of six forms of FLEX-A-POWER for various services from main breakers to individual loads, is designed for light-duty lighting, small tools, appliances. Write for Bulletin TEC-3, THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, Plainville, Conn.

TRUMBULL (T) ELECTRIC



You can specify...

HALL-MACK Quality ACCESSORIES For Every Bathroom Style and Budget



...new Hall-Mack Crystalcrome — jewel-like beauty — brilliant solid chromed brass combined with crystal-clear Lucite — accessories of the finest quality.

... Aristocrome Accessories — classic styling—heavy, rich construction and appearance — chromium plated solid brass— there's no finer accessory line.

...popular Coronado — distinctive modern styling and luxurious looks—for bathroom requirements in the "medium" price range.

... and Tempo Accessories — solid quality at low cost — simple, functional beauty and long life—for modest budgets.

You can put long-established Hall-Mack quality in every bathroom you build, regardless of the budget at hand. Include this recognized, wanted extra quality in the homes you design and build!

Hall-Mack also makes a complete selection of fine Medicine Cabinets... and a number of exclusive Bathroom Specialties which are unique in convenience features.

Bathroom Accessories are Important...

You build a bathroom for a lifetime of use — make sure that the accessories you select have lasting Hall-Mack Quality in style and construction.

See our complete catalog in Sweet's Architectural File.

HALL-MACK COMPANY

1344 W. Washington Blvd., Los Angeles 7, California
7455 Exchange Avenue, Chicago 49, Illinois

THE RECORD REPORTS

(*Continued from page 142*)

For Better Rooms

One hundred forty-five cash awards totaling $25,000 will be made in the Fourth Annual Better Rooms Competition of the Chicago Tribune, which closes Feb. 20, 1950.

Prizes of $100 to $1000 each will be awarded for the best ideas for furnishing and decorating seven types of rooms. The competition is open to all interested persons, except employes of the Chicago Tribune and its subsidiaries and their families and members of the Jury of Awards.

Details and rules of the competition may be obtained from: Better Rooms Competition, Chicago Tribune, Tribune Tower, 435 N. Michigan Ave., Chicago 11, Ill.

Sanitarium; Flower Shop

Two competitions open to students of architecture throughout the United States have been announced by the Tile Council of America in cooperation with the Beaux Arts Institute of Design.

Four awards will be made for a design of a children's tuberculosis sanitarium and two for a nine-hour sketch of an end wall for a flower shop.

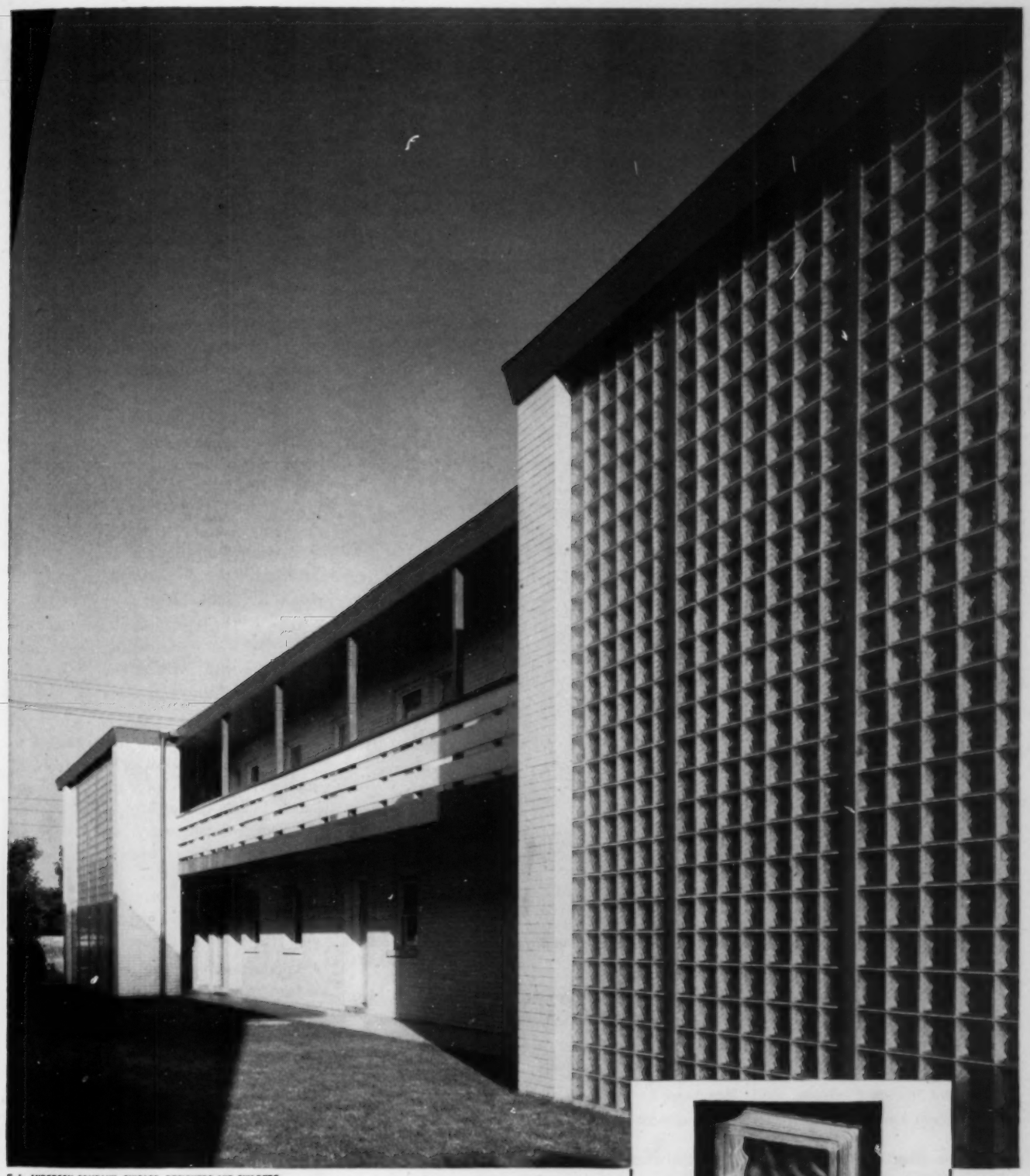
The flower shop sketch must be completed between February 13 and April 17 and will be judged May 4. The sanitarium designs are to be completed between March 20 and May 29 and judged about June 17.

Details are obtainable from the Beaux Arts Institute of Design, 115 E. 40th St., New York 16, N. Y.

ELECTIONS APPOINTMENTS

• Edward C. Meagher, treasurer of the Texas Gulf Sulphur Co. of New York, has been reelected president of the United Engineering Trustees, Inc. Other officers reelected were: Irving V. A. Huie (A.S.C.E.), president of the Board of Water Supply, New York, and James F. Fairman (A.I.E.E.), vice president of Consolidated Edison Co. of New York, as vice presidents; Kurt W. Jappe (A.S.M.E. treasurer), retired director of Purchases, Hercules Powder Co., Wilmington, Del., treasurer; James L. Head (A.I.M.E.), Dept. of Mines, Chile Exploration Co., New York, assistant treas-

(*Continued on page 146*)



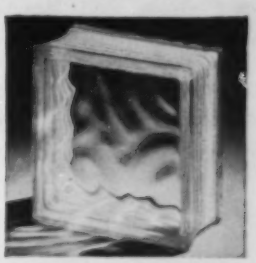
E. L. ANDERSON COMPANY, CHICAGO, DESIGNERS AND BUILDERS

Another unusual use of Insulux Glass Block:

In this Chicago apartment building, twin screens of Insulux Glass Block effectively conceal the outside service stairway. At the same time, Insulux lets daylight into individual apartments while hiding unwelcome views from the tenants.

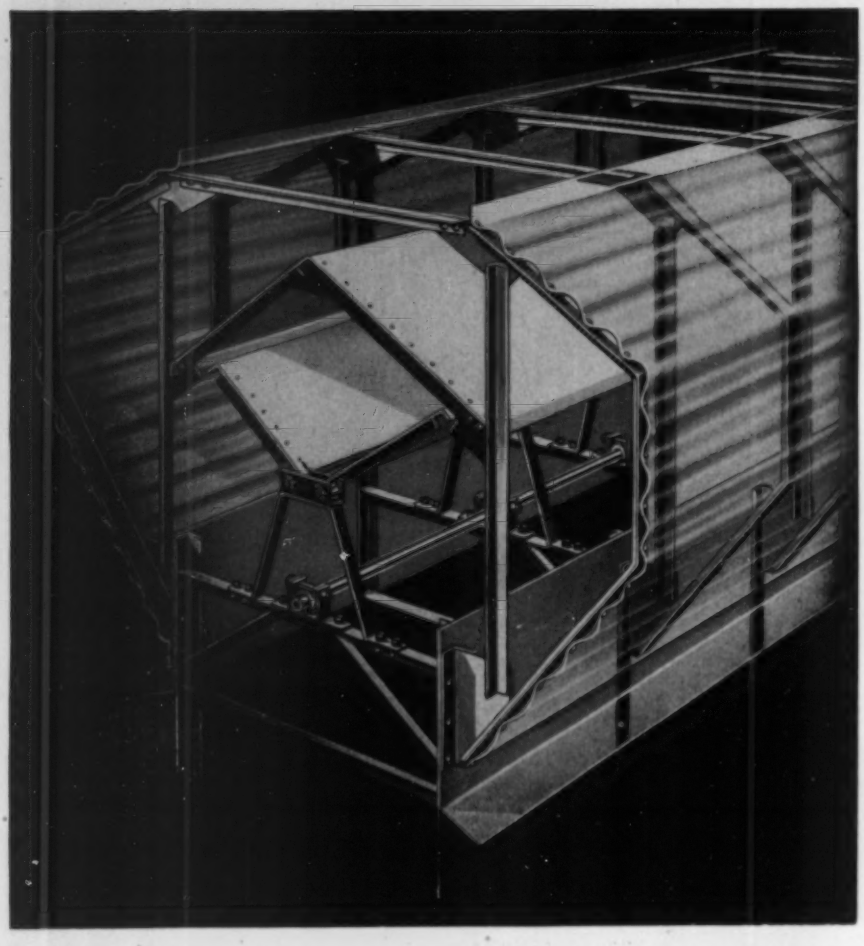
There are many, many uses for this remarkable glass block material—bathrooms, entries, living rooms, partitions, and kitchens are but a few possible places for Insulux.

For complete information, write: American Structural Products Company, Dept. G-113, P.O. Box 1035, Toledo 1, Ohio.



INSULUX
GLASS BLOCK®
AMERICAN STRUCTURAL PRODUCTS COMPANY
Subsidiary of
OWENS-ILLINOIS GLASS COMPANY

FOR STEEL MILLS FOUNDRIES, FORGE SHOPS (HEAVY INDUSTRY)



Adaptable to many applications, the Burt Monovent Continuous Ridge Ventilator is particularly efficient in heavy industry. The Monovent may be installed on any type roof. It removes heat, smoke and fumes the entire length of the building—converts the roof line to a giant exhaust valve. And Monovent's simple, sturdy construction assures long, trouble-free life with almost no maintenance.

The Monovent may be the solution to your ventilating problems. Burt engineers will be glad to help with your plans—without obligation.

SEE SWEET'S OR WRITE FOR CATALOG AND DATA SHEETS

The BURT MFG. Co.

48 E. South Street Akron 11, Ohio, U.S.A.

VENTILATORS • LOUVERS • OIL FILTERS • SHEET METAL SPECIALTIES

THE RECORD REPORTS

(*Continued from page 144*)

urer; John H. R. Arms (A.I.M.E., A.S.M.E.), secretary.

• Election of A. T. Waidelich as vice president in charge of research for The Austin Company has been announced in Cleveland by George A. Bryant, president of the national engineering and construction firm. Mr. Waidelich will supervise plant location surveys and economic and engineering reports as well as independent research projects.

• Alexander Knowlton, A.I.A., has been named architectural editor of *Living for Young Homemakers*. Mr. Knowlton had been engaged in private practice, but earlier was associated with such firms as Edward D. Stone (New York), Graham, Anderson, Probst & White (Chicago), Fellheimer & Wagner (New York), Ellerbe & Company (St. Paul) and Dodd & Richards (Los Angeles).

• Miss Katherine Coffey, assistant director of the Newark Museum since 1947, succeeded Miss Alice W. Kendall as director of the museum on November 1.

• Henry L. Logan has been named to the newly-created post of vice president in charge of research for the Holophane Co. A Fellow of the American Institute of Electrical Engineers and of the Illuminating Engineering Society and a member of numerous other scientific and technical groups, Mr. Logan has been manager of the Department of Applied Research for Holophane.

• Appointment of Paul F. Croley as assistant executive director of the Philadelphia City Planning Commission has been announced by Edmund N. Bacon, executive director.

OFFICE NOTES

Offices Opened

Alfred Francis Bordeleau, A.I.A., formerly on the design staff of the Denver University School of Architecture and Planning, has opened an office for the practice of architecture at 410 Eighth St. N., Great Falls, Mont.

Anthony S. Ciresi, A.I.A., announces the opening of an office for the practice of architecture at 7113 Euclid Ave., Cleveland 3, Ohio.

Stewart S. Granger, A.I.A., has taken offices for architectural practice at

(*Continued on page 148*)

Connor FIRST AGAIN WITH

Selective logging assures your future supply of Connor Northern Hardwoods

"Laytite"

Maple and Birch

FLOORING

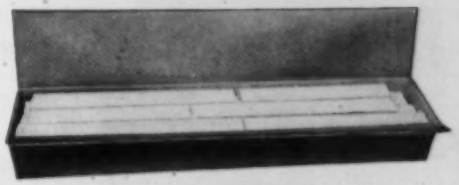
(LONG LENGTHS WIRE TIED)

in CARTONS

1. Have retail sales appeal.
2. Keep flooring clean and dry.
3. Keep moisture content more uniform.
4. Make inventory easy—contents are plainly marked for grade and scale.
5. Give buyers exact cost of 10 sq. ft.
6. Save time in laying mixed lengths without breaking several bundles.

MFMA SPECIFICATIONS

Cartons keep flooring dry and clean.



Assorted lengths save time in laying.

Each carton labeled for easy inventory.

Telephone No. 3 or 418 • *P. O. Box 112-R* • *Teletype – Marshfield No. 26*

The CONNOR LUMBER and LAND CO. Sales Office MARSHFIELD, WISCONSIN

Send for illustrated 75th Anniversary Book

LO-LEVEL COOLERS

BATTERY

WALL

PEDESTAL

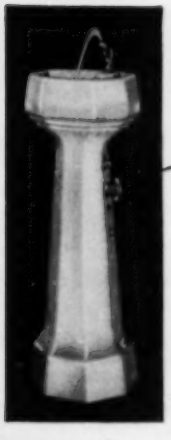
A COMPLETE LINE for every need

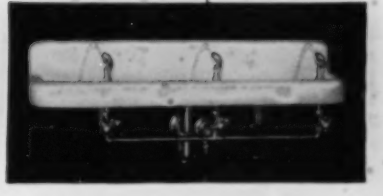
For your 1950 requirements you can choose from a wide variety of Halsey Taylor models for school installations. The new Lo-Level cooler for school cafeterias is but another evidence of Halsey Taylor's continuous development in drinking-water equipment design. Thus you can be sure of the ultimate in economy and service, no matter what your needs!

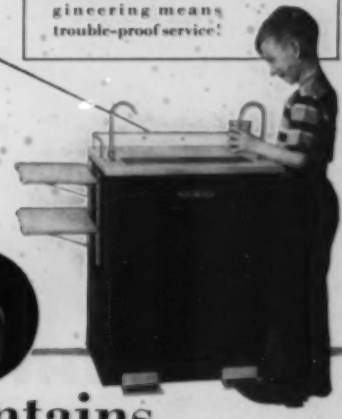
THE HALSEY W. TAYLOR CO., *Warren, Ohio*

The Little Cooler for Little People

This ideal cafeteria cooler is the right height for children. Foot-pedal operation means extra convenience for the child and less confusion in the room, and Halsey Taylor engineering means trouble-proof service!







HALSEY TAYLOR Drinking Fountains

AS-1

Guth lighting switched our office gripes to grins"

says one of our most recent customers

"Our employees were constantly complaining of the poor seeing conditions under our old pre-war lighting system. It was dim and depressing. What a difference when we installed our new GUTH precision-planned "Cadets"! Now the office is stimulating and cheery—no shadows, no glare. Our employees' morale is far higher; now they see their work is an entirely different light."

Wherever you want the ultimate in illumination, GUTH Luminous-Indirect CADETS* are the answer. They produce high intensities with remarkably uniform distribution and balanced brightness ratios.

• May we send you Bulletin 815-J with full details on

GUTH CADETS

—the fluorescent fixture chosen by impartial experts for America's No. 1 lighting job—the relighting of West Point!

Guth LIGHTING

THE EDWIN F. GUTH COMPANY / ST. LOUIS 3, MISSOURI

*® Leaders in Lighting since 1902 113

THE RECORD REPORTS

(*Continued from page 146*)

3006 Wilshire Blvd., Los Angeles 5, Calif.

Elmer J. Weis and O. S. Roe have opened the architectural and engineering office of Weis & Roe, 2237 St. Louis Ave., St. Louis, Mo.

Walter Zick, A.I.A., and Harris Sharp, A.I.A., announce the opening of their offices at 1806 South Main St., Las Vegas, Nev. (P.O. Box 1808).

New Addresses

The following new addresses have been announced:

Laurence P. Johnston, A.I.A., 4105 Wisconsin Ave. N. W., Washington 16, D. C.

Carl Koch, Architect, & Associates, 57 Brattle St., Cambridge, Mass.

Walter Kuetzing, Architect, Stapleton Bldg., Billings, Mont.

Hans G. R. Schickele, Architect, 2220 Bancroft Way, Berkeley 4, Calif.

M. Tony Sherman, Architect and Industrial Designer, 732 N. E. 79th St., Miami 38, Fla.

Technical Planning Associates, 111 Whitney Ave., New Haven 10, Conn.

New Firms, Firm Changes

Richard B. Benn and Roswell H. Johnson Jr. announce the formation of a partnership for the general practice of architecture under the name of Benn & Johnson, Registered Architects, with offices at 5907 Penn Ave., Pittsburgh 6, Pa.

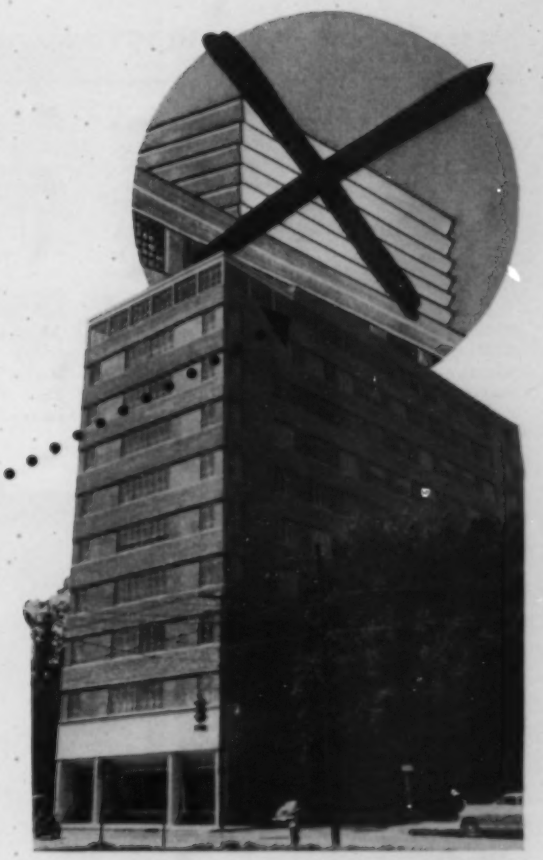
Vladimir Bobovitch and Ngwai Fook have announced that they are practicing in partnership as Vladimir Bobovitch-Ngwai Fook Associates at 204 East 46th St., New York 17, N. Y.

Joseph B. Diamond, Licensed Professional Engineer and Attorney at Law, has resigned as Deputy Commissioner of Public Works and resumed law practice with Bleakley, Platt, Gilchrist & Walker at 120 Broadway, New York 5, N. Y.

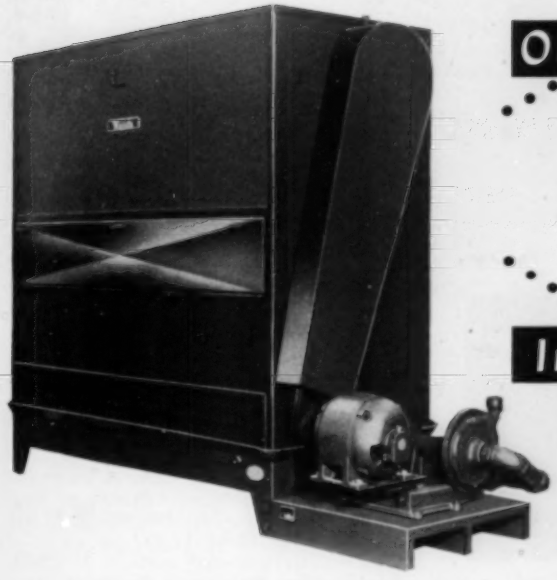
ERRATUM

Max J. Wolfson, A.I.A., Architect, is now practicing in new offices at 1005 W. Belmont Ave., Chicago, Ill. The RECORD regrets having erroneously indicated in a previous announcement that Mr. Wolfson was opening an office rather than moving to a new location and having misspelled his name.

MODERN BUILDINGS *demand* MODERN DESIGNED COOLING EQUIPMENT



New Pioneer Building in Lake Charles, Louisiana. The Marlo units serving its cooling system are designed to preserve the architectural beauty. Installation was handled by the Air Conduit Co., Lake Charles. Weil and Moses, New Orleans, were the consulting engineers.



Outside *a clear unbroken skyline*

Inside *greater functional efficiency*

Smart men's club on top floor of building. Dependable Marlo Units play a vital role in providing the controlled comfort that members appreciate.

with MARLO COOLING UNITS

Specify Marlo Evaporative Condensers and Cooling Towers for rooftop installation.

- There's no worry about appearance—Marlo Units can be designed to fit *below the parapet* of the building and out of sight.
- And wherever they're installed—inside or out—they operate *silently* . . . and *economically* . . . and save up to 95% of the normal water demand.

MARLO • HEAT TRANSFER Since 1923

WRITE . . . *for complete data on Marlo Evaporative Condensers and Cooling Towers.*

Marlo COIL CO. • 6135 Manchester Rd. • St. Louis 10, Mo.

8. "Three ways to cut your operating costs." By K. A. Wing. *Buildings*, Mar. 49:24. Economies through study of lighting, heating & elevator costs & controls.

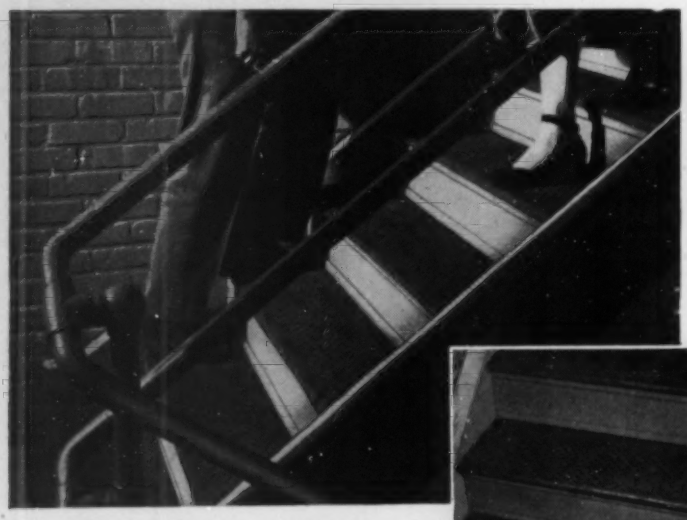
9. "Who will build them this time?" By Glenn McHugh, VP Equitable Life. *Skyscraper Management*, Aug. 49:5–7, 31–34. Trend toward reduction of office building construction in central areas.

10. "Commercial real estate market for 1949." By Leo J. Sheridan. *Skyscraper Mgt.*, Mar. 49:3–5, 32–34. Address before Mortgage Bankers Assoc. Dangers of new construction for existing rentals. **g**

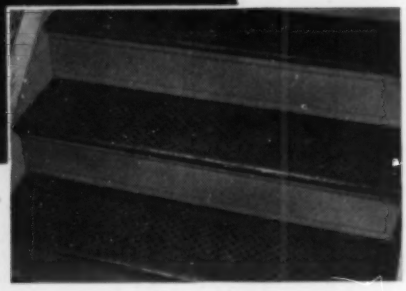
11. "How high can office rentals go?" By Sterling H. Bigler. *Buildings*, Mar. 48:38–41. Report to Middle Atlantic Conference of Building Owners & Managers. Opposition to new construction. **g** Same material in *Skyscraper Mgt.*, Feb. 48:8–9. **g**

12. "Building construction under present conditions." By Charles M. Chuckrow. *Buildings*, Mar. 48:27–28. Financial analysis: 23-story building built in N.Y.C. in 1946. Same material in *Skyscraper Mgt.*, Mar. 48:3–5, 27–28. **g**

13. "Case study of present construction costs." By George R. Bailey. *Buildings*, Dec. 47:28–30. Tall building cost & rental income analysis.



Feralun Safety Treads installed in 1923, in office of RCA Victor Division, Camden, N. J. (Courtesy Public Relations Department, RCA Victor).



FERALUN
SAFETY TREADS

"INSTALLED IN *1923*... STILL GIVING SATISFACTORY SERVICE TODAY"

They planned well for safety and for durability—those who were responsible for these Feralun* safety treads—installed when this RCA Victor building was erected in 1923. A quarter century of resistance to wear under the many thousands of feet that have gone up and down them since Calvin Coolidge first entered the White House! A quarter century of underfoot safety, too, on Feralun's non-slip surface! And, as the photograph shows, these same treads can still be counted on for many more years of maintenance-free service—and safety.

Examples like this show why architects, engineers and builders insist on "Feralun" treads, nosings and plates. Made of cast iron with wear-resistant abrasive particles embedded in walking surfaces, "Feralun" provides a sure-footed "grip" that keeps feet from slipping—and wears and wears. The coupon below will bring you full information on "Feralun." Send it today.

**Also available in Bronze*—(Bronzalun), *Aluminum*—(Alúmalun), *and Nickel Bronze*—(Nicalun).®

AMERICAN ABRASIVE METALS CO.
IRVINGTON 11, N. J.

AMERICAN ABRASIVE METALS CO.
470 COIT STREET
IRVINGTON 11, N. J.

(AR 1-50)
Gentlemen: Please send me full information on Feralun.
NAME ..... TITLE .....
COMPANY .....
ADDRESS .....
CITY ..... STATE .....

14. "Allocation of costs." *Buildings*, Aug. 47:49. Rule of thumb for apportionment of costs to ground & upper floors.

15. "Sell function, not footage." Editorial by Charles A. McCaleb. *Buildings & Building Management*, Mar. 46:23.

16. "Chart aids in analyzing office building operation." By G. M. Lewis. *Buildings & Building Mgt.*, Jan. 46:28–29. **g**

17. "A critique of fixed formula methods of pricing office space." By B. L. Lefler. *Journal of Property Mgt.*, Dec. 45:97–104. Refinements of Sheridan-Karkow formula.

18. "Planned profit-timing for office buildings." By W. Earl Martin. *Buildings & Building Mgt.*, May 45:31–33. Formula for office space financial analysis.

19. "Occupancy decline less than expected." By Dale R. Cowen. *Skyscraper Mgt.*, June 49:3–6. Semi-annual summary of office building operations. **gt**

20. "Slight decline again registered in office building occupancy." By Dale R. Cowen. *Skyscraper Mgt.*, Nov. 48:3–6. 2495 buildings, occupancy av. 98.88%. **gt**

21. "Occupancy trend continuing down." By Roy J. Johnson. *Skyscraper Mgt.*, June 48:3–6. 2445 buildings, occupancy av. 98.99%. **gt**

22. "Income & operating expenses in office buildings." *Buildings & Building Mgt.*, Feb. 45:20–21. Charts of income, expense & operating ratios for 1924–1943. **g**

Year	*Income*	*Operating ratio*
1924	$2.27 psf	57.9% ("normal")
1934	1.45	(low)
1941		80.7% (high)
1943	1.66	76.9%

23. "1948 operating costs in 96 San Francisco buildings." *Buildings*. Total $1.8048 psf rental area. **gt**

24. "1947 operating costs in 93 San Francisco buildings." *Buildings*, Oct. 48: 42. Total $1.6404 psf rental area. **gt**

25. "1947 operating costs in 35 Philadelphia office buildings." *Buildings*, Aug. 48:30–31. Totals: Over 100,000 sf, $1.919 psf; under 100,000 sf, $2.077 psf. **gt**

26. "1946 operating costs in 37 Philadelphia office buildings." *Buildings*, Nov. 47:38–39. Totals: Over 100,000 sf, $1.843 psf; under 100,000 sf, $1.774 psf. **gt**

27. "1945 operating costs in 35 Philadelphia office buildings." *Buildings & Building Mgt.*, Dec. 46:30–31. Totals: Over 100,000 sf, $1.255 psf rental area; under 100,000 sf, $1.345. **gt**

28. "1945 operating costs in 70 San Francisco buildings." *Buildings & Building Mgt.*, Oct. 46: 30–31. Total: $1.4939 psf rental area. **gt**

29. "1940 operating costs in 35 Philadelphia office buildings." *Buildings & Building Mgt.*, Nov. 41:20. Total: $1.39 psf rental area. **gt**

LOCATION, DECENTRALIZATION, ZONING & PARKING

30. Urban Land Institute, Community Builders' Council. *The community builder's handbook*. Urban Land Institute, Washington, D.C., 1947. 205 pp. Preliminary steps, planning, protecting future of development, shopping centers (308 types of business classified in 4 lists for location), statistical appendices. **gptv**

31. Urban Land Institute. *Technical Bulletins*:

#1. Mistakes in community development. By J. C. Nichols. 1945.

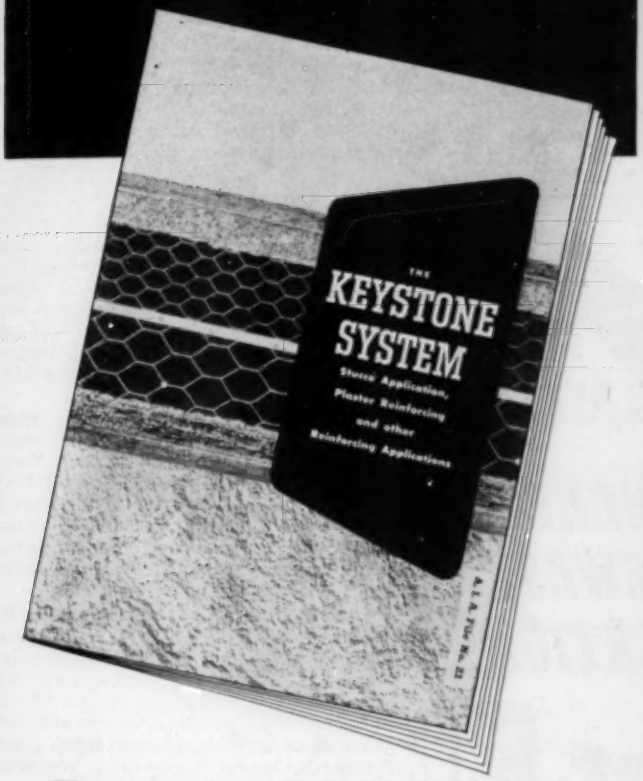
#2. Urban redevelopment enabling acts.

#3. Trends: Urban development & redevelopment.

#4. Mistakes in developing shopping centers. By J. C. Nichols.

(*Continued on page 152*)

This Valuable Guide Helps You Design Easy-to-Sell Houses



Yes, if you want to design attractive houses at lower cost . . . and still add the extra features that appeal to home buyers . . . let this book help you. It explains the Keystone System of Stucco Application—the answer to the need for durable, attractive, quality homes at lower cost.

Besides, this book gives helpful information on the Keystone System of Plaster Reinforcing and other reinforcing applications. Write for your copy *today!*

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

Manufacturers of Keymesh Reinforcing, Welded Fabric, Tie Wire and Nails

BARBER COLMAN

MOTOR-OPERATED VALVES

TYPE FYBA
MOTOR OPERATOR
ON GLOBE FLANGED
VALVE BODY

FOR

ZONE CONTROL

Zone control systems on hot water and steam heating installations require good, remotely-controllable valves for efficient operation. Barber-Colman Motor-Operated Valves have proved ideal for this service in thousands of buildings of all types and sizes. Barber-Colman Valves are ruggedly built for *maximum performance with minimum maintenance.* They are made in all standard sizes up to 6", with globe screwed pattern from ¼" to 4" and globe flanged pattern from 2½" to 6". Three types of motor-operators are available, the choice depending on service requirements. Barber-Colman Motor-Operated Valves are delivered *completely assembled* ready for installation. Motors operate on low voltage and valves may be remotely (and automatically) controlled by any three-wire circuit single-pole double-throw switch or its equivalent, such as a thermostat, pressure switch, or relay. Be sure your files include latest engineering data on these useful, dependable, economical Valves. *Consult your Barber-Colman representative for any advice on applications.*

Write for Literature

BARBER-COLMAN COMPANY
1232 ROCK STREET • ROCKFORD, ILLINOIS

#5. *City planning bibliography*. 1946.
#6. *Auto parking in central business districts*. 1946.
#7. *Slums — "Improved land"* value. 1947.
#8. *Subdivision regulations*. 1947.
#9. *Commercial parking in residential areas* (transitional). 1948.
#10. *Prohibition of residences in industrial districts*.
#11. *Shopping centers* (19 examples). 1949.

32. Armstrong, Robert H. & Homer Hoyt. *Decentralization in New York City*. A preliminary report to Urban Land Institute, Jan. 1941. Excellent survey of N.Y.C. population & other statistics. **gt**

33. Canoyer, Helen G. *Selecting a store location* (Economic Series #56). U. S. Department of Commerce, Office of Domestic Commerce, Marketing Division GPO 1946. 68 pp. Selection of town, community & site. Practices in seven selected retail lines. Appendices: Distribution & operating expense ratios. Excellent bibliography on location. **bdt**

34. *Picking a location for a small business* (Small Business Series #3). N. Y. State Department of Commerce. Elementary location techniques. **st**

35. *Parking Manual*. American Automobile Association, Traffic Engineering & Safety Department, Washington, D. C. 1946. 181 pp. The parking problem — Causes & effects of parking difficulties — Factual studies — Improving curb parking conditions — Off-street parking facilities — Educating the public — Other community activities affecting packing — Appendices — Review of zoning regulations in 40 cities. **bdfgptv**

36. *Zoning applied to parking*. Eno Foundation for Highway Traffic Control. Saugatuck, Conn., 1947. Survey (586 returns) of cities of 50,000–100,000 pop.

37. "A new solution for parking." By P. M. Rea. *Journal of Property Mgt*. Sept. 47:33–43. Electro-Park, an automatic elevator parking system. **dgm**

PLANNING & GENERAL REFERENCES

38. Maze, Coleman L. (NOMA) *Office management, a handbook*. Ronald Press Co. N. Y., 1947. 870 pp. Chapter 11: *Office environment*: pp. 299–331. Location & setting — Building characteristics — Construction — Maintenance & operation — Appearance. Data on color & insurance (39 types outlined). **dfpv**

39. Ripnen, Kenneth H. *Office space administration — Streamlining office methods & layouts* (Office Management Series #114). American Management Association, N. Y., 1946. pp. 15–24. Report of lecture & discussion on basic office plans, organization elements, standards, compartmented organization, flexibility, office planning tools, steps, maintenance & control.

40. Pennicke, H. C. *Office layout for effective operations — Standards for measuring office efficiency* (Office Management Series #110). American Management Association, N. Y., 1946. pp. 28–47. Report of lecture & discussion on layout, site, private offices, lighting, clerical areas, space standards, layout suggestions, reception space, washrooms & wardrobes. **pt**

41. *Cost of industrial moves*. By R. H. McCarthy. American Management Association, N. Y., 1950. Successive moves of large organizations because of inadequate space or poor planning may cost as much as new construction. Urges more careful recording of moving costs.

42. *Office planning & layout*. Report issued by Policyholders Service Bureau of Metropolitan Life Insurance Company, N. Y. Rev. 1945. 26 pp. Surveys, area allocation, rough layout, partitions, heating & ventilating, lighting, acoustic treatment, decoration, finished layout, furniture, moving, small office layouts, references. **bp**
Reprinted by Remington-Rand and in *The Office*, Feb. 46:70. *Buildings & Building Mgt*. Mar. 46:30–33 **p**
Apr. 46:33–36 **pt**

43. *Washroom & locker-room facilities*. Report issued by Policyholders Service Bureau of Metropolitan Life Insurance Company, N. Y. Rev. 1948. 28 pp., Planning, special requirements, materials, fixtures & equipment. **ptv**

44. "Office buildings." Building Types Study #145. *Architectural Record*, Jan. 49:97–116. Esso buildings in Caracas & Baton Rouge, office buildings in Mobile and Chicago. Solar & earthquake problems. **dmpv**

45. "Office buildings." Building Types Study #130. *Architectural Record*, Oct. 47:119–146. New departures in office building design (Lathrop Douglass): Flexibility, fenestration, columns & framing, modules, economics. Examples. **dpsv**
Same material in *Buildings* Jan. 48:36.

46. "Modern offices." *Architectural Rec-*
(*Continued on page 154*)

Infra
INSULATION, INC.
10 Murray St.
New York,
N. Y.

HERE'S THE NEWEST INSULATION

TYPE 6

INFRA ACCORDION INSULATION

Three thick sheets of permanently separated aluminum

INFRA ACCORDION ALUMINUM and TRIANGULAR REFLECTIVE AIR CELLS

Light, Strong Easily Installed Competitive in Price

PLEASE LOOK AT THE THERMAL VALUES*
4" to 7½" Insulation Value in a 2½" Depth

There are SIX, 97% effective, radiant-heat-repelling surfaces, EACH of ONLY 3% emissivity (against ordinary insulation's 90%). There are SIX non-conductive, reflective air spaces. FIVE barriers to convection consist of THREE EXTRA-THICK aluminum sheets, IMPERVIOUS to warm or cold air, WATER VAPOR, or any gas; and TWO Fiber Separators, flame, mold and vermin-proof, which also block inner convec tion. For 16" and 24" centers.

***THERMAL FACTORS, INFRA TYPE 6**

Down-Heat	C.044, R 22.72 = 7½"	dry rockwool
Up-Heat	C.08, R 12.50 = 4"	dry rockwool
Wall-Heat	C.073, R 13.69 = 4½"	dry rockwool

WRITE Infra for details and FREE COPY of "Bulletin No. 38," issued by the National Housing Agency of the Government, reporting tests of Aluminum Insulation made by the U.S. Bureau of Standards, and dealing principally with the problems of condensation and of heat and vapor transfer.

Address Dept.

AR

Figure it at

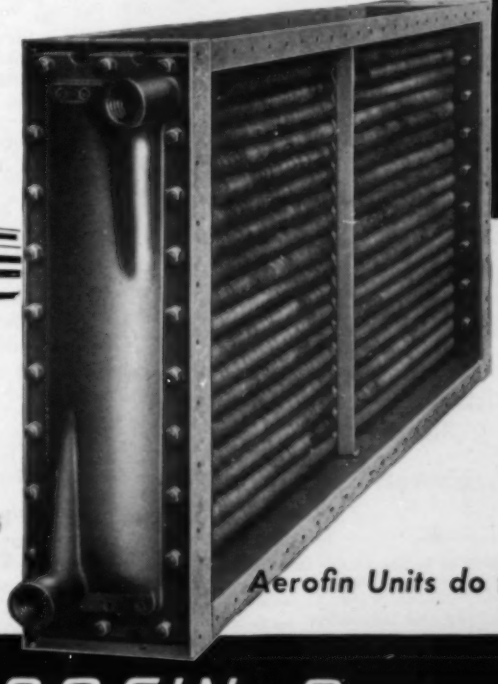
100% FULL RATING

AEROFIN RATINGS ARE ACCURATE AND RELIABLE

Aerofin's continued research has developed accurate ratings that are good for the life of the unit. You can always count on Aerofin to deliver full-rated capacity — full efficiency.

Over 25 years' experience, combined with unequalled production facilities, enables Aerofin to select just the right surface and materials for each particular job. Aerofin rigidly controls every phase of the production of its heat-transfer coils and units.

This man is looking for air bubbles —he is testing Aerofin heat-transfer coils with air pressure in a specially illuminated tank. If there are no bubbles, it means the immersed Aerofin unit has withstood the severe strains of steam and hydrostatic pressure tests and is ready to give you long, efficient service.



Throughout the **AIR CONDITIONING** *Industry —*

Aerofin Units do the Job Better, Faster, Cheaper

AEROFIN CORPORATION

410 South Geddes St. SYRACUSE 1, N. Y.

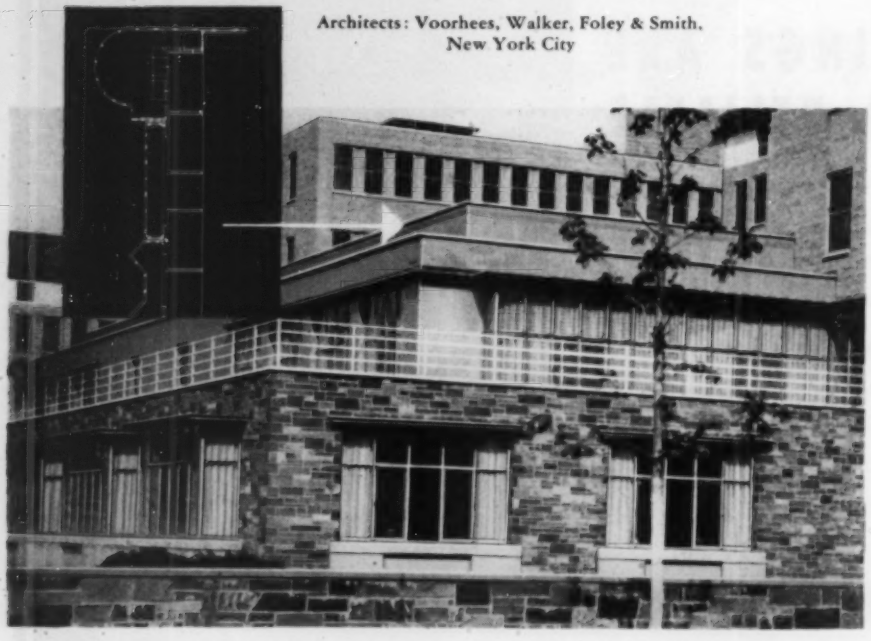
NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

nature and seaporcel* blend in rugged beauty

For harmony with other materials - for variety and contrast - or alone in simple beauty - turn to Seaporcel Architectural Porcelain Enamel. Here, Bell Telephone Laboratories present an imaginative blending of Seaporcel Architectural Porcelain Enamel and *natural rock*. Over 10,000 sq. ft. - in light brown terra cotta finish - was utilized in the exterior facing of this modern edifice at Murray Hill, N. J. For beauty of appearance - low installation and maintenance cost - permanence - resistance to weather - and the integrity of its manufacturer . . .

Seaporcel Architectural Porcelain Enamel is unsurpassed.

Architects: Voorhees, Walker, Foley & Smith, New York City



Like facts? Yours for the asking — a new "Fact Sheet" — giving complete, informative blue print diagrams and specifications of the Bell Telephone Laboratories Dining Room Facilities illustrated above. Just printed. Ask for a copy.

seaporcel metals inc.

28-02 Borden Avenue, Long Island City 1, N.Y.
STillwell 6-4900

See our catalog in SWEET'S 6d/3

For More Information — Use This Form

Member, Porcelain Enamel Institute

*Reg. U.S. Pat. Off.

SEAPORCEL METALS INC. 28-02 Borden Avenue, Long Island City 1, N.Y.

Please send me Fact Sheet on Bell Laboratories _____
Send me General Catalogue and other information _____

NAME _____

COMPANY _____

ADDRESS _____ CITY _____ STATE _____

SMALL BUSINESS BUILDINGS

(*Continued from page 152*)

ord, Mar. 45:99–116. New trends, patterns in office planning, examples. **pstv**

47. "Office & loft buildings." Building Types Study #73. *Architectural Record*, Apr. 43:73–82. Article by Ely J. Kahn. Time-saver Standards on office building flexibility, space distribution, rentable area, construction, utilities. **dmpv**

48. "Office & commercial buildings." Building Types Study. *Architectural Record*, Dec. 41:81–91. Shopping center at Belmont, Mass. & several smaller office buildings. **dpv**

49. "Office buildings 1891–1941." *Architectural Record*, Feb. 41:43–49. Examples. **pv**

50. "Buildings for business." *Architectural Record*, Dec. 40:73–94. Examples & Time-saver Standards for telephone installations & flashings. **dpv**

51. "Design reference on office buildings." *Architectural Record*, Dec. 38:86–118. Planning, layout, clearances, summer air conditioning, acoustic control, lighting, color, rentability, examples. **bdptv**

52. "Physicosocial environment of the office." By A. H. Stricker. *The Office*, Aug. 49:29–44, 110–117. Adequate seeing conditions, noise control, ventilation, checklist for working conditions. **tv**

53. "When you build your own office building." By Harold C. Pennicke. *The Office*, Oct. 49:56–60, 151–161. Comprehensive article. See also "Layout standards for modern offices" by same author published in *The Office* for Mar. & Apr. 45 & to be republished soon. **dv**

54. "Principles of office space planning." By Ralph Tabakin. *The Office*, Sept. 48:48–51, 153–157. **v**

55. "Space allotment & control." By Kenneth H. Ripnen. *Office Management & Equipment*, Feb. 48:31–32. Report form for preliminary design projects. **f**

56. "Modern office layout will pave the way for more profitable renting." *Buildings & Building Mgt.*, Aug. 45:27–30; Sept., 45:40–42. Typical offices for accountants, lawyers, insurance & general use. **p**

57. "Planning the new office building." By I. A. Herrmann. *The Office*, May, 45: 37–40. **dpt**

58. "Layout standards for modern offices." By Harold C. Pennicke. *The Office*, Mar. 45:37–42; **dpt**; Apr. 45:38–44, 74, 76. **dv**

59. U. S. Post Office Department. *Leaflets giving regulations for mailing equipment & installations*:

(1) Mailing chute rules, regulations & specifications.

(2) Apartment-house mail receptacles. Regulations & instructions (used also for business flats in residential areas).

(3) Instruction sheets listing approved manufacturers of apartment mail receptacles.

60. Two office buildings (MacKie & Kamrath). *Progressive Architecture*, Dec. 48:50–55. One-story, stone & wood construction. **pv**

61. Two-story office building (Raphael Soriano). *Arts & Architecture*, Nov. 48: 38–39. **v**

62. Office building for 5 business agents (Ain). *Arts & Architecture*, Aug. 48:30–31. One-story project. **ps**

63. Projects: Lawyers' office building (Ain). *Arts & Architecture*, May 47:26; **ps**; Oct. 48:36. **ps**

(*Continued on page 156*)

Presenting The New and Beautiful

Double-Duty INSULITE*

INTERIOR FINISH BOARD PRODUCTS

A Colorful New Line for Imaginative Design

Mr. Faber Birren — nationally known consultant on color preferences of the buying public, selected these new consumer approved Insulite colors. He is retained by many of the world's largest manufacturers strictly for his experience in the vital field of consumer color preference and its relation to consumer buying habits. You profit by his two decades of research in the color wants and buying motives of the American public.

No Guessing Against Human Taste — These are Colors the Public Wants

Why gamble in selecting colors? Since color is vital to the success of your projects, every possible avenue of fact and scientific analysis was assessed and judged for its selling value before these new Insulite colors were chosen.

This was neither guesswork nor private opinion. Choice was based upon market research to accurately measure the desires of today's buying public. You can be *sure* these new Insulite colors are keyed to buying opinion.

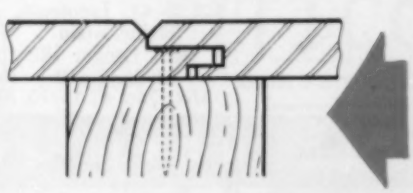
Exceptional Sales Advantages

Rarely has there been a line of new products as rich in variety and flexible in adaptation as these new Insulite Interior Finish Products! Singly or in combination, they can be employed in a stimulating variety of striking and original effects. The finished result is beautiful . . . attention-getting . . . and exceedingly flattering.

Best of all (from the builder's point of view), these new products can be applied fast and easy . . . without special preparation or the use of special clips. No skill required — anyone can do it. Just use nails or staples direct to framework. Saves time, cuts application costs. This line was designed as a practical material for doing better interior jobs at economical cost.

New Insulite Joint

Assures a trim, neat, tight joint that defies dust infiltration and stays securely in position. Concealed fastening without using special clips. Application is fast and easy with nails or staples.



LUSTERLITE TileBoard and Interior Board

Colors: White, Ivory White. **Texture:** Smooth . . . high light-reflecting. **Joint:** TileBoard employs new Insulite Joint (illustrated below); Interior Board has square edged joint. **Sizes:** TileBoard, 12″x12″, 16″x16″, 16″x32″; Interior Board, 4′ width by 6′, 7′, 8′, 9′, 10′, and 12′ lengths.

DUROLITE Plank and Interior Board

Colors: Ivory, Pale Green, Woodtone Light, Woodtone Dark. (The two Woodtones in the Plank are cartoned, half light and half dark, to provide variegated effect in application.) **Texture:** Rough . . . highly durable. **Joint:** Plank employs new Insulite Joint (illustrated below); Interior Board has square edged joint. **Sizes:** Plank widths are 8″, 10″, 12″ and 16″ — Lengths 8′, 10′, and 12′. Interior Board — 4′ width by 6′, 7′, 8′, 9′, 10′, and 12′ lengths.

WEVELITE Interior Board

Color: Ivory White. **Texture:** Rough surface. **Joint:** Square edged. **Sizes:** 4′ width by 6′, 7′, 8′, 9′, 10′ and 12′ lengths.

SMOOTHLITE Interior Board

(Formerly SMOOTHCOTE). **Color:** Natural. **Texture:** Smooth. **Joint:** Square edged. **Sizes:** 4′ width by 6′, 7′, 8′, 9′, 10′ and 12′ lengths.

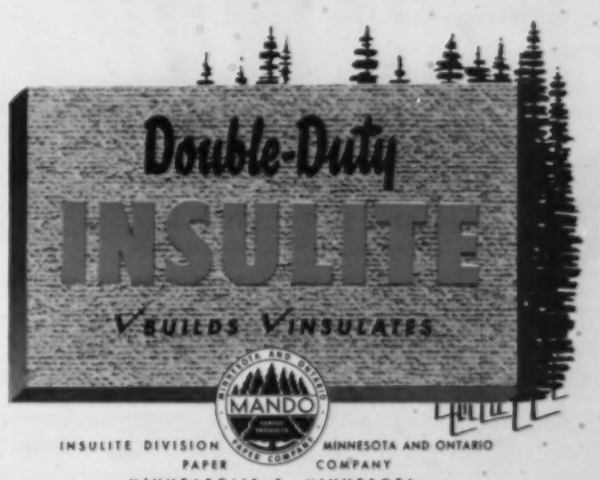
ACOUSTILITE ¾″ and FIBERLITE ½″

Colors: White. **Texture:** Porous, giving a travertine stone effect. **Joint:** Butt Joint Edges Beveled and Kerfed. **Applied with:** Cement. **Sizes:** 12″x12″, 16″ x16″, 16″x32″.

*Reg. U. S. T. M.

Refer to Sweet's File, Architectural Section 10a-9

1-50



INSULITE DIVISION MINNESOTA AND ONTARIO PAPER COMPANY
MINNEAPOLIS 2, MINNESOTA

Put THIS spring balance
in YOUR windows for...
ECONOMY
SMOOTH OPERATION
PERMANENT SERVICE
plus perfect weatherstrip
protection!
MASTER
NO-DRAFT
Sash Balance
Nowhere in the building does satisfaction mean so much to home owners than trouble-free windows. SELL THIS FEATURE with this combination unit. Equips both new and old sash. Eliminates weights and pulleys and painting. Made of non-corrosive metal and stainless steel for salt air locations or as a distinctive sales feature. Tested and proved in thousands of installations including government buildings.
Write today for complete information and specifications.
See Master No-Draft, demonstration at our Booth in space 117 at the National Association of Home Builders Show at the Stevens in Chicago, Feb. 19-23
mail coupon now....
MASTER METAL STRIP SERVICE
1718 N. Kilbourn Ave., Chicago 39, Ill.
Please send me, without obligation, complete information about Master No-Draft Sash Balance.
NAME
ADDRESS
CITY
ZONE
STATE

SMALL BUSINESS BUILDINGS

(*Continued from page 154*)

LIGHTING

64. *Recommended practice of office lighting.* Illuminating Engineering Society, N. Y., 1947. 47 pp. Office tasks, influence of lighting on seeing, environmental factors, office lighting (daylight & artificial), specific areas, brightness ratios, nomenclature, wiring. **dtv**

65. "Proper maintenance — antidote for light loss." By W. R. Wilson. *Buildings*, May 49:36–39. Wiring, line voltage, access to lighting equipment, painting, **gtv**

66. "Light, eyesight, environment & their influence on production." *Office Management & Equipment*, Mar. 48:19–22 **v**; *The Office*, Dec. 47:68–72, 110–114. **v** Reports of two-year study by Public Buildings Administration in Washington in punchcard subsection of Bureau of Internal Revenue.

67. "Office lighting — a cost study." By R. L. Oetting. *Buildings*, Aug. 47:21–23, 48. Annual costs psf of office space illumination using: enclosing globes; deep bowl indirect; silver-bowl lamp indirect; fluorescent direct-indirect; fluorescent single-lamp troffer. **t**

68. "Light finishes improve office performance." By R. L. Oetting. *Office Management & Equipment*, July 47:33–36. **v**

69. "Influence of lighting on office production." By R. L. Oetting. *Office Management & Equipment*, Oct. 47:62–66, 106. **tv**

70. "Improving office seeing." By W. S. Greenwood. *The Office*, Dec. 46:44–52. **tv**

71. "Basic standards for good lighting." By LeRoy E. Varner. *Buildings & Building Mgt.*, Mar. 46:38–41. Lighting levels, lamp characteristics, brightness & glare, chart for lighting stores & offices. **dt**

MAINTENANCE

72. *Profitable building operation & maintenance.* Stamats Publishing Co. Cedar Rapids, Iowa. Book of reprints from *Buildings & Building Management* magazine.

73. "Outline of building maintenance." By Boyles & Farquhar. *Buildings & Building Mgt.*, May 46:28–30. I, Structure: II, Elevators; III, Equipment.

74. "A building manager's outline of modern cleaning methods." By Boyles & Farquhar. *Buildings & Building Mgt.*, Apr. 46:46–49. I, Public areas; II, Offices; III, Window washing; IV, Blinds & shades; V, Service calls.

75. "Here's why city air is so dirty." Chicago Association of Commerce, Smoke Abatement Committee. *Buildings & Building Mgt.*, Sept. 46:38. Weather & atmospheric conditions related to smoke, coal consumption & dustfall. Dustfall found to measure weather conditions, not a measure of fuel consumption. **g**

76. "Background for floor maintenance." By C. A. March. *Buildings*, Sept. 47:48–53. Safety measures, materials & methods for floor maintenance. **t**

77. "Background for floor selection.' By C. A. March. *Buildings*, July 47:38–40. Cement-concrete, cork, asphalt & mastic tile, hard tile & terrazzo. *Buildings*, Aug. 47:39–43. Linoleum, magnesite, marble, travertine, wood.

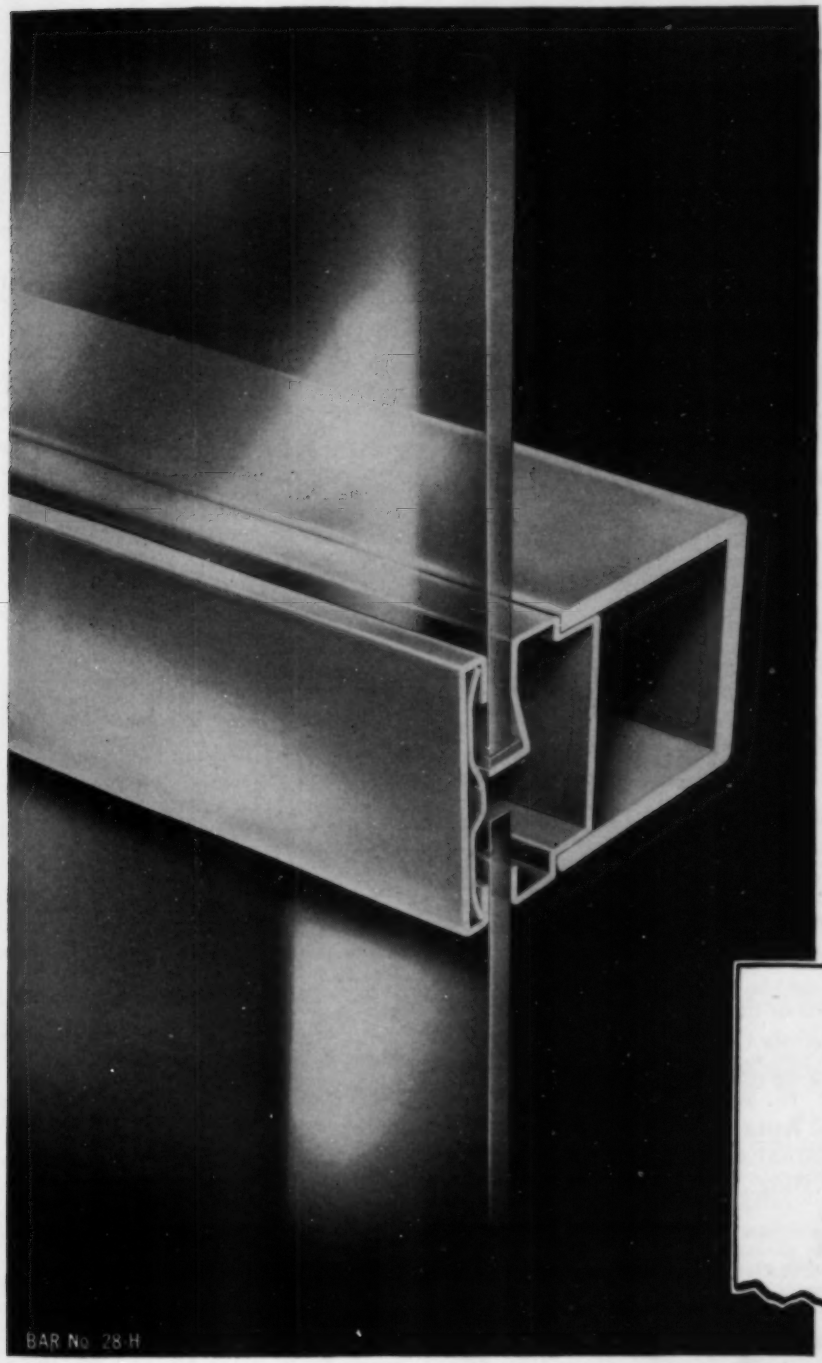
78. "Longer life for resilient floors." By D. E. Smalley. *Buildings & Building Mgt.*, Jan. 47:13–15. Maintenance for linoleum, cork, rubber, asphalt tile flooring.

79. "How to select floor treatments." By D. E. Smalley. *Buildings & Building*

(*Continued on page 158*)

New Versatile Division Bar

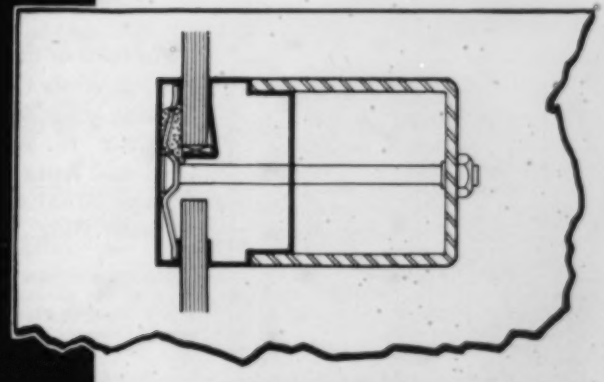
IN PITTCO PREMIER STORE FRONT METAL



● This new Pittco Premier Division Bar (No. 28 H or V) will simplify design and construction on jobs where large areas of Plate Glass must be subdivided. Two features make it extremely practical. An interchangeable spring member permits this new bar to be used both horizontally and vertically. And skillful design has achieved unrivalled simplicity of structure and of installation. At intersections, a concealed fastening locks cross members together securely. Because of the bar's construction, mitering is unnecessary.

Division Bar No. 28 has a shallow profile and plain face, making it suitable for use in a wide variety of store front designs. It is extruded to give it maximum strength, yet it is not large and heavy. The extruded method of production assures a finish rich in tone and gloss.

The production of this versatile division bar is a result of Pittsburgh research . . . aimed to help solve architectural and building problems encountered in the field.

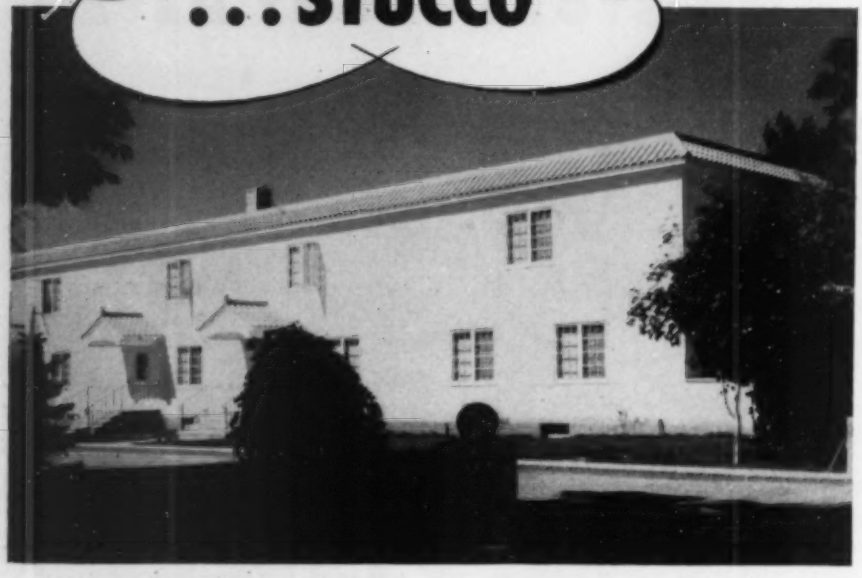


PITTCO STORE FRONT METAL

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

FOR ENDURING WHITENESS
...STUCCO



For lasting stucco...
ATLAS WHITE CEMENT

Here's whiteness, appealing brightness that finds and fills the eye... *lasting* beauty that smiles at time and weather. It is clean, crisp, enduring stucco...made with a matrix of Atlas White Cement.

Such a matrix...pure white, or one of an infinite variety of pigment-based colors...brings out the full beauty of stucco. It also sets off, in blend or contrast, the full color of pigments used in portland cement paint or the aggregates used in terrazzo and architectural concrete slabs.

Utility? Durability? Atlas White Cement complies with ASTM and Federal Specifications for portland cement. It has the same advantages when used for concrete. Stucco, cement-paint, terrazzo, architectural slabs...made with Atlas White Cement...all clean easily and maintenance costs stay low.

ATLAS WHITE *DURAPLASTIC
air-entraining portland cement adds new advantages to stucco at no extra cost. It provides increased plasticity that makes application easier; insures greater durability; offers stouter resistance to weather. Ask for details.

For further information on the uses of Atlas White Cement, see SWEET'S Catalog, Section 4B/3 and 13C/5, or write to Atlas White Bureau, Universal Atlas Cement Co. (United States Steel Corp. Subsidiary), Chrysler Bldg., New York 17, N. Y.

**DURAPLASTIC is the registered trade mark of the air-entraining portland cement made by the Universal Atlas Cement Company.*

AR-S-15

FOR BEAUTY AND UTILITY
ATLAS WHITE CEMENT
FOR TERRAZZO, PAINT, SLABS, STUCCO

"THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries*
Sunday Evenings—NBC Network

(*Continued from page 156*)

Mgt., Oct. 46:19–20, 39. Waxes, cleaners, sealers, paints.

80. "What every manager should know about techniques in decorating." *Buildings*, Aug. 48:47–51. Article on painting. **gt**

81. "Color schemes for offices." By C. E. Seghers. *The Office*, Nov. 46:60–66. Talk at National Business Show. Chart showing physical characteristics of spectrum colors, reactions, associations, etc. **g**

82. "Use of color for office painting." By W. W. Krug. *The Office*, Mar. 46:37–41, 54–60. DuPont recommendations. **v**

83. Color under foot. *Buildings*, Oct. 49:35. Benefits of dark, colored sidewalks: reduction of reflections, glare and surface cracking. **v**

FIRE PROTECTION & SAFETY

84. *National Building Code.* National Board of Fire Underwriters, N. Y., 1949. 258 pp. **dt**

85. *Building code standards for installation of heat producing appliances, heating, ventilating, air conditioning, blower & exhaust systems.* National Board of Fire Underwriters, N. Y., 1949. 40 pp. **dt**

86. *Standards . . . for installation of air conditioning, warm air heating, air cooling & ventilating systems.* National Board of Fire Underwriters, N. Y., 1946. (NBFU Pamphlet #90). Includes appendix dated Aug. 1948.

87. *National Board of Fire Underwriters Bulletins.*

#10. Jan. 22 '35: Hazard of combustible lining in airducts.

#35. Apr. 15 '37: Hazard of air conditioning systems.

#68. Dec. 15 '38: Life safety in buildings.

#121. May 15 '41: Automatic devices for heating equipment.

#165. Apr. 2 '43: Acoustic materials.

#168. May 15 '43: Fire-resistant floor & ceiling constructions.

#239. Sept. 2 '46: Oil burner fire causes.

88. *List of inspected fire protection equipment and materials.* Underwriters' Laboratories, Inc., Chicago, N. Y., San Francisco. Jan., 1949. 200 pp.

89. "Tough category — Tough spot — Action needed." By Rex E. Hieronymous. *Skyscraper Mgt.*, Jan. 48:10–11. **g**

90. "Fire causes." *Buildings & Building Mgt.*, Jan. 45:36.

91. "The day our office burned." By Mary J. Scott. *The Office*, Apr. 47:48–52, 72–73. Graphic story of fire salvage. **v**

92. *Office hazards.* Report issued by Safety Bureau of Metropolitan Life Insurance Company, N. Y., 10 pp. Checklist.

PERIODICALS

In addition to the regular architectural periodicals the following will be of interest to office building planners:

93. *Buildings* (Monthly). Stamats Publishing Company, 427 Sixth Ave., SE. Cedar Rapids, Iowa. $3.00/yr. (Formerly Buildings & Building Management).

94. *Skyscraper Management* (Monthly). National Association of Building Owners & Managers, 134 South Lasalle St. Chicago 3, Ill. $3.00/yr.

95. *Journal of Property Management* (Quarterly). National Association of Real Estate Boards, 72 West Monroe St. Chicago 3, Ill. $5.00/yr.; $1.25/copy.

96. *Urban Land* (Monthly). Urban Land Institute, 1727 K St., NW, Washington 6, D.C. $10.00/yr.

Now! a New Design Freedom for Architects

THE SCHLAGE "Long Backset"

The Schlage "long backset" allows the lock to be installed any distance from the door edge. This means that architects can now place the lock wherever it will produce the best design effect. Large, eye-catching escutcheons can be used for more dramatic treatment of entrances.

The "long backset" is a feature found only in Schlage cylindrical locks. It embodies proven Schlage design and construction principles.

A new brochure, illustrating the "long backset" and many Schlage lock designs is now available. A request to your Schlage dealer or to Schlage Lock Company will promptly bring you a copy.

Schlage Pantheon Design
(8" escutcheon)

SCHLAGE®

SCHLAGE LOCK COMPANY

2201 Bayshore Boulevard • San Francisco 19, California

PRODUCTS

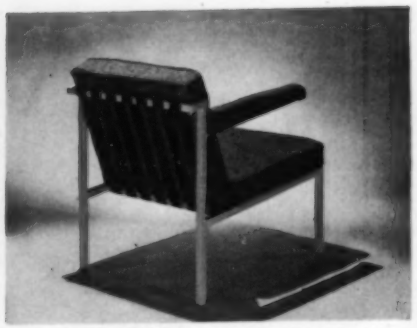
(*Continued from page 124*)

equipped with offset brackets which provide for 6-in. overlap of the shades. The angle may be mounted to the wall, ceiling or window head. Shades are of the spring roller type and are available to measure in tan or black cloth. Luther O. Draper Shade Co., Spiceland, Ind.

Metal Furniture

A new collection of metal and foam rubber furniture, designed by architect William Armbruster, has been introduced by the Edgewood Furniture Co. The simple frames are of square steel tubing with welded joints, matte-finished in lacquered charcoal, off-white, gun-metal, olive or gray. These finishes are said to be unconditionally guaranteed against chipping and corrosion. The seats and back cushions are of foam rubber, upholstered in a variety of materials, including a new nylon fabric designed for hard wear. Cushions are supported by webbing offered in six standard colors: red, black, green, aqua, lime or beige.

Chairs have sturdy and trim construction



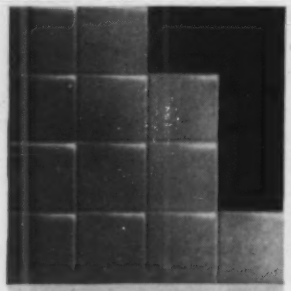
The group was specifically designed for use in public places where durable construction is needed; however, the neat, trim appearance makes the line equally suitable for homes or other uses. The collection consists of 11 pieces: two large side chairs; an occasional arm chair; an armless easy chair; a group consisting of a 24-in.-wide unit chair, an armless love seat and a club chair; a large lounge chair with a head rest; a bench; a slate-top lamp table; and a bronze-based, marble-top cocktail table. Tables are also available with wood plank or formica tops. Edgewood Furniture Co., 208 E. 27th St., New York, N. Y.

Sun Filter Coating

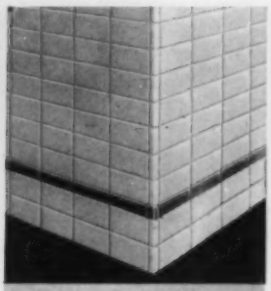
Infracote is a plastic coating for windows, glass block, etc., designed to prevent fading and bleaching by the sun and also to shut out the heat rays. In appearance, the coating is said to be practically colorless, but to turn a faint

(*Continued on page 162*)

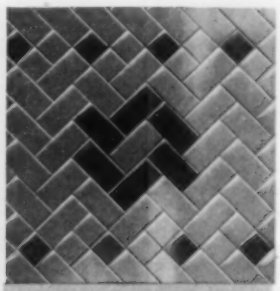
LOW IN COST · LIGHT IN WEIGHT
Enduring Beauty!
HASTINGS AIRCRAFT ALUMINUM alumitile
Guaranteed by Good Housekeeping



INSIDE FINISH
Attractive, smooth, lustrous enamel finish *permanently* bonded to sturdy aircraft aluminum . . . 14 vital colors . . . will not crack, peel or chip. Easy to clean.



OUTSIDE FINISH
A choice of 7 beautiful exterior colors in regular or embossed finish, applied by an exclusive process that insures a maximum of color control, density and uniformity.



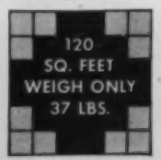
SELF-DECORATING
A variety of sizes and colors permits modern decorative designs on interior or exterior walls . . . each job tailored to individual requirements for distinctive, lasting beauty.

FIREPROOF . . .
RUSTPROOF . . . WEATHERPROOF
HASTINGS *alumitile* is impervious to fire, rust and water, and cannot corrode. May be used *anywhere* indoors or outdoors with gratifying results. It has a gleaming bone-hard enamel finish . . . the lifetime colors are baked on. This amazing wall facing is enjoying ever increasing popularity in the construction of new buildings and the modernization of old. It strikes a modern tone which has brought enthusiastic endorsement from leading decorators, architects and contractors. Yet its cost is surprisingly low, its strength and adaptability almost unbelievable.

SCORES OF USES
The wide versatility of HASTINGS *alumitile* is expressed in its countless uses for homes, institutions, business buildings. It is ideally suited for bathrooms, kitchens, laundries, utility rooms; for dairies, bottling plants, breweries, bakeries, pharmacies, hotels, hospitals, dental offices; for store and theatre fronts, lobbies, service stations.

METAL TILE PRODUCTS, INC.
HASTINGS, MICHIGAN
Makers of Hastings alumitile, alumi-SHIELD awnings, doorhoods, mouldings and flashings

EASY TO APPLY—
EASY TO SELL
Offers consistent quality, sanitary sealing, insulation value, handling flexibility, scope for design, uniformity of workmanship—all at a marked saving in labor hours.



STRENGTH WITHOUT BULK
Save on bulk; save on shipping and handling costs; save on storage space. Lightweight HASTINGS *alumitile* is packaged compactly for convenience and economy. Well adapted to large wall areas where weight and square-foot costs are important factors.

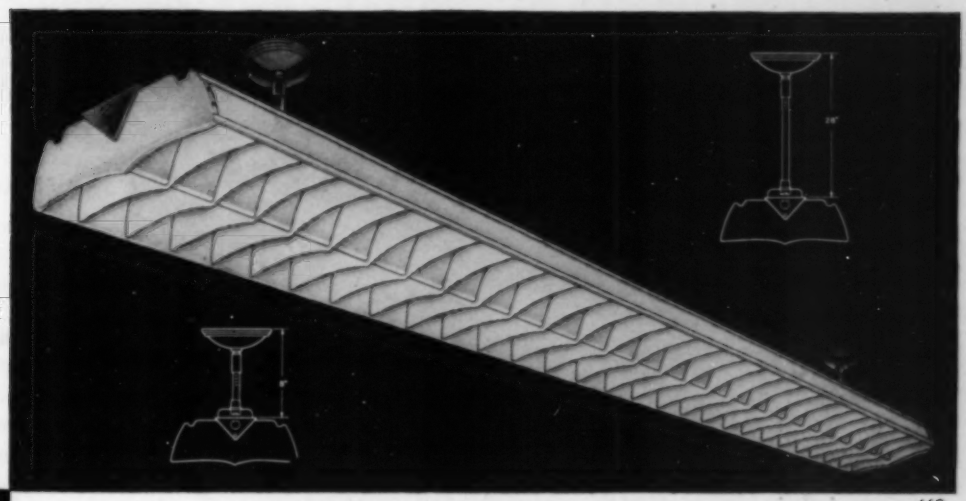
METAL TILE PRODUCTS, INC.
DEPARTMENT 102, HASTINGS, MICHIGAN
I should like to know more about your products.
I am a ☐ Distributor ☐ Dealer ☐ Architect ☐ Contractor
Name
Address
City State

AN UNUSUAL PROFIT OPPORTUNITY FOR LIVE DEALERS AND DISTRIBUTORS
USE THIS COUPON

NOW!

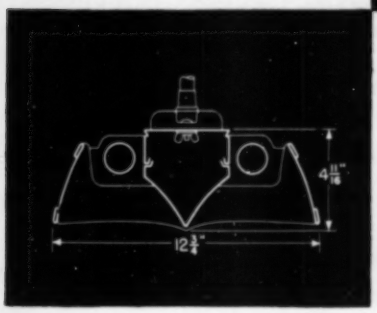
DAY-BRITE'S LUVEX

NEW!



469

For two 96" T-12 Slimline lamps, single unit or continuous installations. For suspension mounting, listed with 8" and 28" "A-J" Adjustable hangers.



"DECIDEDLY BETTER" SLIMLINE

Once in a blue moon, a truly great fixture makes its appearance. Now, after years of research and designing, the matchless new Day-Brite "LUVEX" is ready.

All the usual advantages of Slimline, of course — instant starting . . . extremely high efficiency.

But then, add these "LUVEX" extras—sturdy, *no-sag*, heavy gauge steel chassis, *enclosure and louvers completely interlocked into a rigid one-piece unit*, quick, easy installation and smart appearance—and the "LUVEX" is absolutely *everything* you expect of Slimline lighting.

Maintenance? *Simple!* So simple, in fact, that the "LUVEX" can be relamped and cleaned without disturbing a single part of the fixture—without so much as touching a latch, chain, nut or bolt!

Get the full "LUVEX" story. It will pay you to know all the facts about this remarkable new Day-Brite development. Write today for Bulletin 10-M.

IT'S EASY TO SEE WHEN IT'S
DAY-BRITE Lighting

Distributed nationally by leading electrical wholesalers
Day-Brite Lighting, Inc., 5465 Bulwer Ave., St. Louis 7, Mo.
In Canada: Amalgamated Elec. Corp., Ltd., Toronto 6, Ontario

PRODUCTS

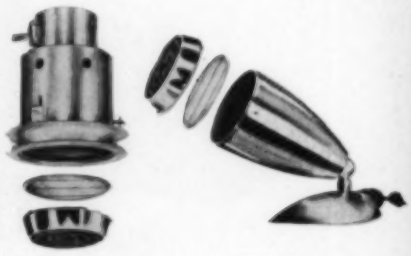
(*Continued from page 160*)

yellow in sunlight. It is claimed to serve as an effective heat protective device, while transmitting approximately 84 per cent of visible light. The coating is said not to be affected by atmospheric conditions or to present a fire hazard.

Its use is recommended by the manufacturer for large window areas. Lite Control Products Co., Nutley 10, N. J.

Air Distribution Unit

Designed for use with ventilating and air conditioning systems in schools and public buildings, the *Uni-Flo* grill with integral volume control is said to combine draftless air distribution and regulation of air volume in a single unit. Quantity and direction of air are regulated by adjustments accessible from the grill face. Cores are removable for duct access and cleaning. The rectangular units are supplied in a prime gray coat or in a selection of electroplated metal finishes. Barber-Coleman Co., Rockford, Ill.



New fixtures with louvers and filters

Lighting Fixtures

The *Midget-Lite* line of lighting fixtures has been introduced for use with the new 75-watt, R30 lamps or the 100-watt standard lamp. Available in recessed, portable, screw-in, box plate and clamp-on models, the fixtures feature baffled air vents to prevent light spill, a "brushed satin" clear lacquer finish, and universally adjustable spring tension sockets. The sockets are said to have no wing nuts or set screws and to stay put at any angle. A special device is included to prevent wire twisting.

The hoods of most models are 8 by 4⅝ in., with extension pipes available from 6 to 48 in. in length. Recessed, Midget-Toplite fixtures are 6⅞ in. in depth and 5 or 5⅞ in. in dia. Louvers and color lenses are available for use with all models. Swivelier Co., Inc., 30 Irving Pl., New York 3, N. Y.

Electric Water Heaters

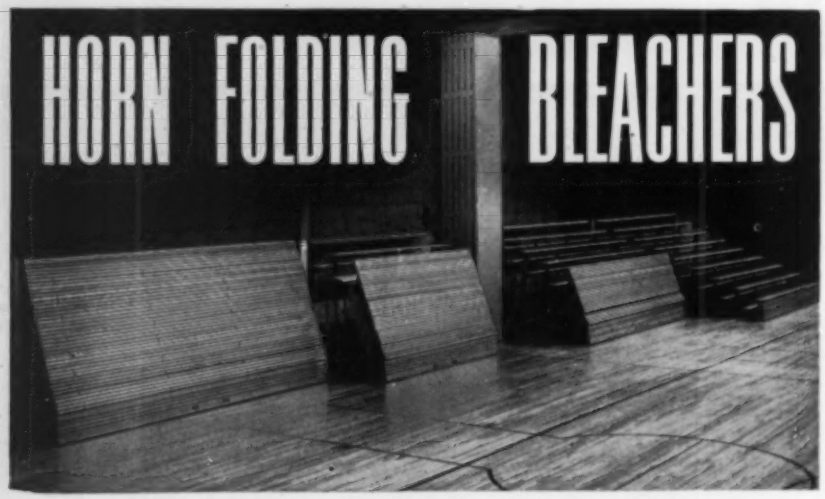
The *Milwaukee* line of electric automatic storage water heaters is being offered as a companion-line to A. O. Smith Corp.'s round and table-top heaters. The new heaters were developed for the popular price field and are available in common round sizes. Features include full-blanketed fibrous insulation, sealed immersion units, "rear-vu" connections, and "Anchorloc" assembly of tank to base. A. O. Smith Corp., Kankakee, Ill.

Plastic Fabric Prints

Suskana fabrics, designed for use as upholstery, draperies, etc., are made

(*Continued on page 164*)

HORN FOLDING BLEACHERS



Horn Folding Bleachers and Horn Folding Partitions for Greater Space Utilization

ROWS	FLOOR SPACE		**HEIGHT
	IN USE	*CLOSED	
3	4 Ft. 9 In.	1 Ft. 8¾ In.	3 Ft. 0 In.
4	6 Ft. 7 In.	2 Ft. 0⅛ In.	3 Ft. 9 In.
5	8 Ft. 5 In.	2 Ft. 3½ In.	4 Ft. 6 In.
6	10 Ft. 3 In.	2 Ft. 6⅞ In.	5 Ft. 3 In.
7	12 Ft. 1 In.	2 Ft. 10¼ In.	6 Ft. 0 In.
8	13 Ft. 11 In.	3 Ft. 1⅝ In.	6 Ft. 9 In.
9	15 Ft. 9 In.	3 Ft. 5 In.	7 Ft. 6 In.
10	17 Ft. 7 In.	3 Ft. 8⅜ In.	8 Ft. 3 In.
11	19 Ft. 5 In.	3 Ft. 11¾ In.	9 Ft. 0 In.
12	21 Ft. 3 In.	4 Ft. 3⅛ In.	9 Ft. 9 In.
13	23 Ft. 1 In.	4 Ft. 6½ In.	10 Ft. 6 In.
14	24 Ft. 11 In.	4 Ft. 9⅞ In.	11 Ft. 3 In.
15	26 Ft. 9 In.	5 Ft. 1¼ In.	12 Ft. 0 In.
16	28 Ft. 7 In.	5 Ft. 4⅝ In.	12 Ft. 9 In.
17	30 Ft. 5 In.	5 Ft. 8 In.	13 Ft. 6 In.
18	32 Ft. 3 In.	5 Ft. 11⅜ In.	14 Ft. 3 In.
19	34 Ft. 1 In.	6 Ft. 2¾ In.	15 Ft. 0 In.
20	35 Ft. 11 In.	6 Ft. 6⅛ In.	15 Ft. 9 In.

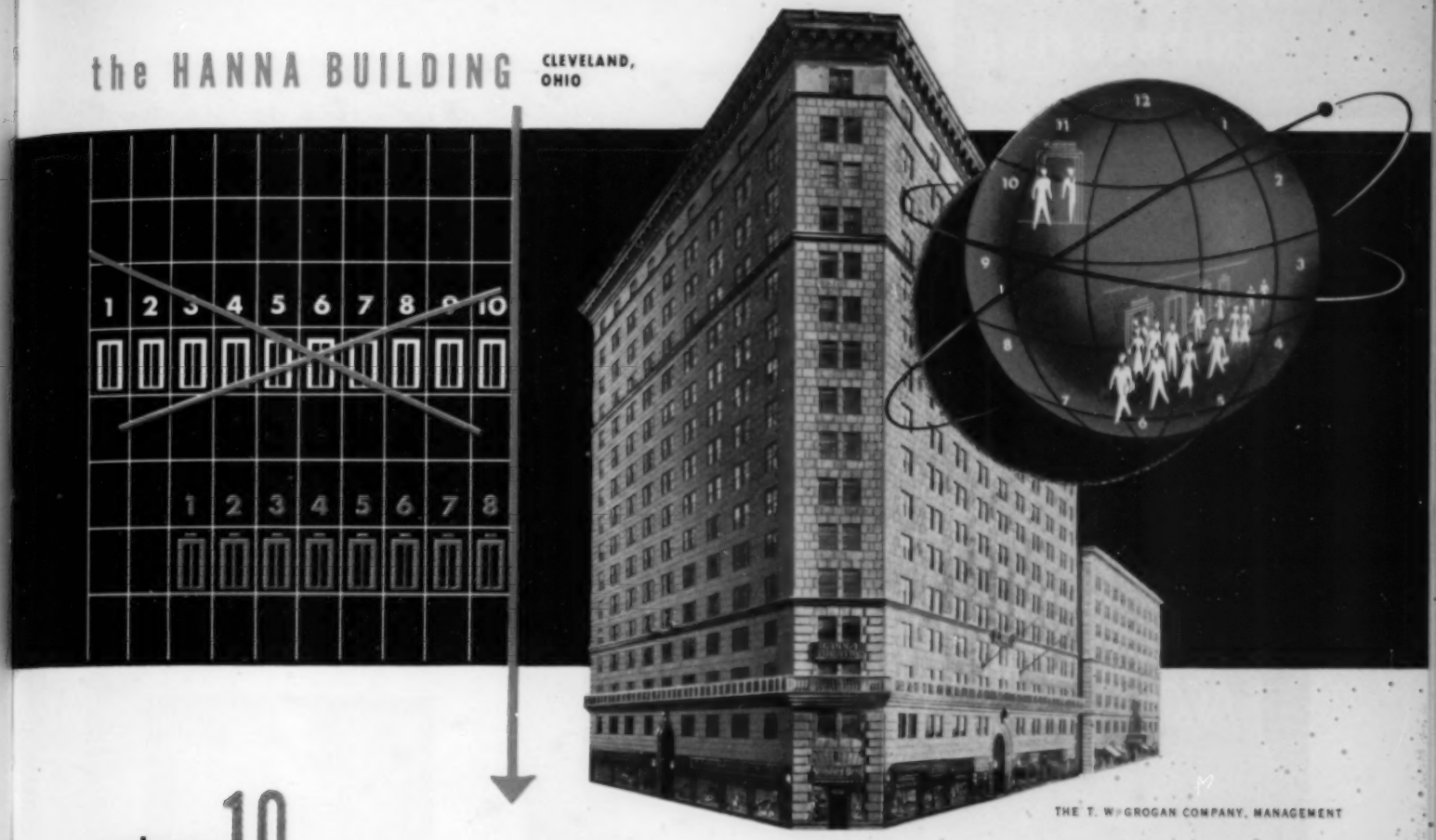
CHECK YOUR SPACE REQUIREMENTS

*Dimension includes 4½ in. space beween top seat and wall.
**Height in open position same as closed. For Bleachers higher than 20 Rows write for complete details and dimensions.

FOR SEATING CAPACITY FIGURE 16" PER PERSON. WRITE FOR COMPLETE DETAILS ON THE "3 IN 1 HORN GYM PLAN". NO OBLIGATION

HORN BROTHERS CO.
A DIVISION OF HORN INDUSTRIES
FORT DODGE, IOWA ESTABLISHED 1909

the HANNA BUILDING CLEVELAND, OHIO



THE T. W. GROGAN COMPANY, MANAGEMENT

replaces 10 car-switch elevators with 8 OTIS AUTOTRONIC ELEVATORS

Saves The Cost of 2 Cars and Reduces Passenger Waiting Time Throughout The Entire Business Day

Hanna Building tenants and visitors will be delighted with the time-saving convenience of modernized service. For the new Otis AUTOTRONIC Elevators, with their traffic-timed automatic supervision, have been designed to reduce the elevator interval from 50 seconds to less than 25 seconds during the morning peak period. A similar speed-up of service will be applied to the other 5 traffic patterns of the day. So, with the time interval reduced through automatic supervision, 8 AUTOTRONIC elevators will serve all floors—and give far better service than the manually operated 5 Express and 5 Local cars they replace.

From the management viewpoint there's the increased prestige of unexcelled elevator service and the economy of installing and operating 8 instead of 10 elevators. Otis AUTOTRONIC ELEVATORING—already bought by 38 NEW and MODERNIZED office buildings, hotels, banks and department stores—is explained in Otis Booklet B-721-F.

Elevator service in the Hanna Building Annex is also being modernized by replacing 4 Car-Switch Elevators with 2 Otis ELECTRONIC Signal Control Elevators. Here, too, the modernization will be dramatized with Otis electronic "touch" buttons that summon cars as if by magic. Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.

Otis

AUTOTRONIC
traffic-timed
ELEVATORING

PRODUCTS

(*Continued from page 162*)

of Vinylite plastic film, printed by a multi-color rotogravure process. The method is claimed to allow reproduction of any color photograph and to be low in cost when the fabrics are mass produced.

The plastic film reputedly drapes well, is easily sewn, and wipes clean with a damp cloth. It is also said to resist fading, cracking, stretching, shrinking and staining, and not to support flame.

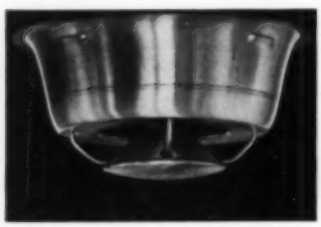
The material is available in a large variety of stock patterns printed on a choice of several opaque, clear or translucent base colors. Susquehanna Mills, Inc., 404 Fourth Ave., New York 16, N. Y.

WEATHER STRIPS FOR SLIDING DOORS
ACCURATE
In this splendid Kentucky home, "ACCURATE" metal weather stripping for sliding doors was installed in 1944 in accordance with specifications by Mr. James Kellum Smith, of McKim, Mead & White, Architects. Five years of constant use have demonstrated the truly dependable performance of sliding doors fitted with "ACCURATE" weather stripping. Everywhere, more and more architects and owners are looking to "ACCURATE" for real sliding door weather protection. Consultation invited.
ACCURATE METAL WEATHER STRIP CO., Inc.
215 EAST 26th STREET, NEW YORK 10, N. Y.

Fluorescent Sun Lamp

A new sun lamp, identical in dimensions and electrical operating characteristics with standard fluorescent lamps, is said to radiate over a large area with an output concentrated in the mid-ultraviolet wavelengths. Reportedly, no elaborate starting and operating controls are necessary, and the device starts immediately without any warm-up period.

A suggested use for the lamp, besides therapeutic treatments, is for low intensity space irradiation for such places as schools, offices, factories, recreational areas and hospitals. The lamp is claimed to have a life of 4000 hr, to be low in price and power consumption, and to be cool to the touch. It is available in 20 and 40-watt units. Westinghouse Lamp Div., Bloomfield, N. J.



Baffle employs rubber mounted cone

Speaker Baffles

Lowell metal speaker baffles are designed for low-level sound control and use with any customary speaker. Made of spun aluminum or spun steel, the baffles may be finished in any colored lacquer desired, and feature light weight and easy installation. Among the 12 models available are: a flanged, directional wall type; a directional, recessed wall type; and models with suspended, flush or recessed mountings for various height or dropped ceilings. Most types are also available in combination with Circline fluorescent light fixtures. All hardware for mounting speaker to housing is furnished, but speakers are not included. Lowell Metal Products Corp., 1531 Branch St., St. Louis 7, Mo.

Circulating Pump

Planned for use in the small house field, the *B&G 75* booster is said to be light in construction, quiet in operation, compact, easy to install and efficient. The pump uses a 1/15 hp motor, is oil lubricated, and has a precision-ground water-tight seal. Connections consist of

(*Continued on page 166*)

New! A Luminous Ceiling by LITECONTROL Featuring Ultra-New,

Low Brightness Lenses

Here's the newest thing in lighting — an office with a luminous ceiling, featuring exceptional low brightness both lengthwise and crosswise, utilizing ultra-new Holophane No. 9015 Controlenses*. Construction is simple — installation easy — maintenance minimized — and ceiling costs cut!

Because of the design flexibility of this system, either large or small areas can be lighted attractively with variable intensities by using standard Bipin lamps or T-8 or T-12 Slimline lamps in various switching arrangements.

We'd like to tell you more about this new lighting triumph — help you with lighting layouts or advice, in applying it to your projects. Why not write today?

Area: Approximately 200 sq. ft.

Ceiling Height: 8'-7"

Lamps: 6-96T12 75 Watt Warmtint Slimline
6-48T12 40 Watt Warmtint Slimline

Lenses: 144-#9015 Holophane Controlenses*

Wattage: 900.
Watts per square foot: 4.5

Intensity:
Average on desk — 112 Footcandles Initially
Average in entire room — 70 Footcandles Initially

Brightness Readings:
Along lamp axis:
45°-1.2 Candlepower per sq. inch
60°-0.14 Candlepower per sq. inch
70°-0.11 Candlepower per sq. inch
Across lamp axis:
45°-1.5 Candlepower per sq. inch
60°-0.3 Candlepower per sq. inch
70°-0.3 Candlepower per sq. inch

*®HOLOPHANE CO., INC.

•

LITECONTROL CORPORATION
36 Pleasant Street, Watertown 72, Mass.

LITECONTROL *Fixtures*

KEEP UPKEEP DOWN

DESIGNERS, ENGINEERS AND MANUFACTURERS OF FLUORESCENT LIGHTING EQUIPMENT DISTRIBUTED ONLY THROUGH ACCREDITED WHOLESALERS

Efficiency goes
UP

Costs come
DOWN

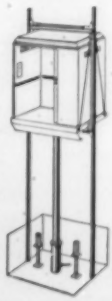
Rotary Oildraulic Elevators are the most economical type for 2, 3 or 4 story buildings

Smooth, quiet operation
Smooth starts and stops, accurate floor leveling, and quiet operation are guaranteed by Rotary's precision mechanism.

No costly penthouse
Because it's pushed from below, not pulled from above, an Oildraulic Elevator requires no costly, unsightly penthouse.

Lighter shaftway structure
Rotary's powerful Oildraulic jack supports the car and load—so there's no need for heavy, load-bearing columns and footings.

Over 50,000 Rotary Oildraulics in Use
Rotary, oldest and largest maker of oil hydraulic elevators and lifts, has served major companies and building owners throughout the nation. Our coast-to-coast organization offers the most complete service in this field. Write for Catalog.



ROTARY LIFT CO.
1101 Kentucky, Memphis, Tenn.

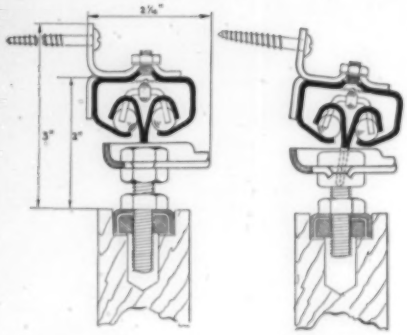
Rotary
Oildraulic Elevators
PASSENGER AND FREIGHT

See Section 33a in Sweet's File
10

PRODUCTS

(*Continued from page 164*)

¾-in. forged-steel, non-breakable, two-bolt flanges, the joint construction of which is claimed to permit tightening with little more than finger pressure. Bell & Gossett Co., Morton Grove, Ill.



Hardware features roller mounts

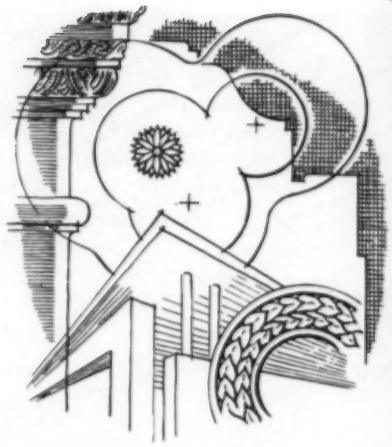
Sliding Door Hardware

A complete set of residential-type hardware for sliding doors, including track, sidewall brackets, stops, screws, and floor guide, features smooth and silent operation on 4 SKF steel balls. The balls roll free in 14-gage steel tracks, without any sort of encasement in which they might get clogged. Doors from ¾ to 1¾ in. thick and weighing up to 150 lb may be used. The door is centerhung from a patented hinge said to eliminate side pressure or friction, and to cause the door to hang vertically always. The tracks of *Zephyr* hardware are said to be easily installed to the side or overhead, to be dust shielded, and to have vertical and horizontal adjustment. The minimum distance from top of door to top of track is 2 in. Double doors require two single sets of hardware. Sliding Door Equipment Corp., 211 E. 37th St., New York 16, N. Y.

Water Filter

The *Fisher* water filter unit is built around a permanent metallic filter element, composed of microscopic bronze spheres. The unit is said to filter up to 10 gal of water per min and to weigh less than 5 lb. A transparent plastic case allows vision of foreign matter collected by the filter. To clean, the filter body is

(*Continued on page 168*)



for forms OLD and forms NEW

Lime Plaster is the Answer

No building material lends itself so willingly to the imagery of the architect. To the smooth surfaces, regardless of their contours; the highly ornamented, regardless of their style.

Also, no substitute has matched good plaster for soundness of construction and life-of-the-building durability. It provides an interior finish that is smooth, clean, free of joints, vermin and rodent proof, fire safe and accoustically right.

Finishing Lime from Northwestern Ohio has long been the accepted standard.

- **OHIO WHITE and HAWK SPREAD are Ohio Hydrate's identical brands of hydrated finishing lime. They are always uniformly right, 99½% pure.**
- **OHIO WHITE AUTOCLAVED Finishing Lime is equally good quality. It needs no soaking. For fine, white coat plaster, brick mortar and other uses.**
- **OHIO SANLIME FINISH, a plaster for sand finish interior work, contains all ingredients in dry-mixed form. In white and in colors: ivory, buff, pink, blue, and light green.**

The red zigzags on the bags are our trademark, your assurance of quality.

The OHIO HYDRATE & SUPPLY Co.
WOODVILLE, OHIO

LOOK FOR THE ZIGZAG BAGS

Send today for your free copy of the rules of the

Chicago Tribune's Fourth Annual

BETTER ROOMS COMPETITION

$25,000.00 in 145 Cash Prizes

ranging from $100.00 to $1000.00 each

for the best ideas for furnishing and decorating seven types of rooms

ALL ENTRIES MUST BE RECEIVED BY 5 P. M. OF FEBRUARY 20, 1950

IN order to bring to readers again this year a full range of ideas for furnishing and decorating various types of home interiors, the Chicago Tribune is conducting its Fourth Annual Better Rooms Competition, offering $25,000.00 in 145 cash awards for the best ideas submitted.

Just as the Chicago Tribune's competitions in 1947, 1948 and 1949 brought out a wealth of fresh and interesting ideas in this field of high popular interest, so the 1950 competition has been designed to set new standards in home interior fashions.

Here is your opportunity to plan one or more typical rooms just the way you would like them to be. And here is your chance to win cash and nation-wide recognition for your efforts.

After the prize winners have been chosen, the Tribune, just as it has in previous years, intends to reproduce the winning ideas, or adaptations of them, in full color in the Chicago Sunday Tribune.

Everyone is eligible to compete, except employes of the Chicago Tribune and subsidiaries, members of their families, and of the Jury of Awards, which, as in the past, will be composed of recognized authorities of high standing in the field of home furnishing and interior decoration.

For complete information to help you prepare your entry, send today for your free copy of the rules which will be sent to you postpaid. The closing time is February 20, 1950. So don't delay. Fill in the coupon below, paste it on a postcard, and mail today.

FILL IN AND MAIL TODAY!

BETTER ROOMS COMPETITION
Chicago Tribune,
Tribune Tower, 435 N. Michigan Ave.
Chicago 11, Illinois AR

Without cost or obligation to me, please send by postpaid mail to me at the address below complete details and rules of the $25,000.00 Chicago Tribune Fourth Annual Better Rooms Competition.

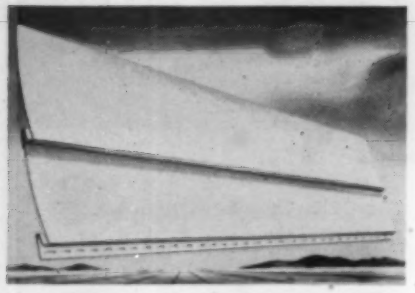
My Name.....

Address.....

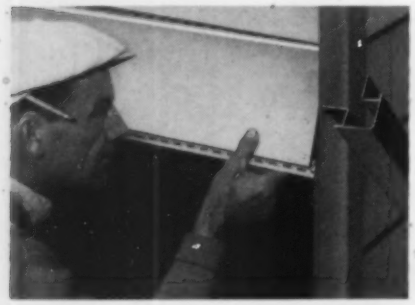
City.....State.....Zone Number (if any).....
(Please PRINT plainly in pencil; ink may blot)

See this
beautiful siding
at the NAHB show

From February 19 through 23, at the N. A. H. B. Show in Chicago, you'll see the *beauty* of Kaiser Aluminum Siding... how easily it's applied... and all these other advantages:



FLAWLESS BEAUTY and quality, free of splits, knots or sawing scars. Baked-on paint finish that can't chip, crack or peel. Strong, dent-resistant aluminum that can't rot, warp, crack or rust, that's fire-resistant, that can't be damaged by termites.



EXCLUSIVE CURVED SURFACE installed under tension to make rigid, sound-resistant insulating siding, weather-proof joints, beautiful shadow lines without wrinkles. And construction costs are *low!* Meets FHA requirements for new construction. Write today for free AIA File!

Kaiser Aluminum Siding is produced by Kaiser Aluminum & Chemical Corporation.

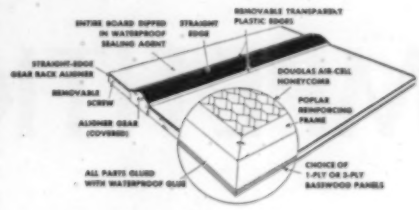
Kaiser Aluminum
SIDING

Sold by Kaiser Aluminum & Chemical Sales, Inc.
Kaiser Building, Oakland 12, California

PRODUCTS

(*Continued from page 166*)

removed by turning a single nut, the element is rinsed clean in tap water, and the assembly replaced. Connections are for ½-in. standard pipe lines. Oscar Fisher Co., Inc., 109 Worth St., New York 13, N. Y.


ENTIRE BOARD DIPPED IN WATERPROOF SEALING AGENT
STRAIGHT EDGE
REMOVABLE TRANSPARENT PLASTIC EDGES
STRAIGHT-EDGE GEAR RACK ALIGNER
REMOVABLE SCREW
ALIGNER GEAR (COVERED)
DOUGLAS AIR-CELL HONEYCOMB
POPLAR REINFORCING FRAME
ALL PARTS GLUED WITH WATERPROOF GLUE
CHOICE OF 1-PLY OR 3-PLY BASSWOOD PANELS

Drawing board has new construction

Lightweight Drawing Boards

The *Featherweight* drawing board employs a honeycomb or air-cell type of core to produce lightness and ease of handling. The core is held by a poplar reinforcing frame, and covered with top and bottom plywood panels with the grain running in different directions for strength. There is a choice of 1- or 3-ply basswood panels. All parts are joined with waterproof glue, and the entire board is dipped in a waterproofing agent for warp resistance. Boards are made in sizes from 12 by 17 to 31 by 42 in., and are optionally equipped with a straight-edge gear-rack aligner, transparent plastic straight edges or a washable carrying case. Cal-Pan Corp., 1111 S. Fremont Ave., Alhambra, Calif.

Exhaust Ventilator

The *Gyra-Flo Exhauster* was designed for roof ventilation requiring low operating noise levels. A minimum of noise is reportedly achieved through careful design to control the flow of air, low wheel-tip speeds, rigid reinforcing and wheels balanced to prevent vibration. Rubber is used to float the base.

The exhausters are shipped fully assembled, complete with motor, drive assembly, frame, housing and safety switch. Free air deliveries range from 680 to 38,000 cfm. The steel plate unit is made in 17 throat sizes, from 12 to 68 in. The overall height is from 31¼ to

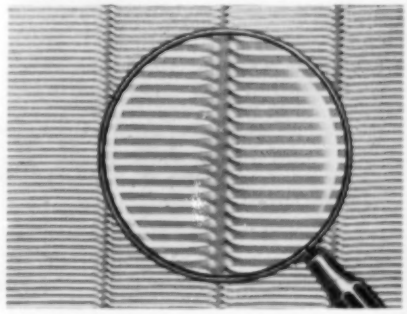
(*Continued on page 170*)

See this new
kind of screening
at the NAHB show

From February 19 through 23, at the N. A. H. B. Show in Chicago, you'll see how Kaiser Aluminum Shade Screening keeps sunniest rooms as much as 15° *cooler!*

You'll see how the thin louvers —set at an angle against the sun— block the sun's rays, *without blocking the view.*

You'll see for yourself why Kaiser Aluminum Shade Screening is one of the fastest selling building supply items ever introduced!



MADE OF TOUGH, high grade Kaiser Aluminum. Can't rust or stain. Never needs paint. Adds extra beauty to any window.

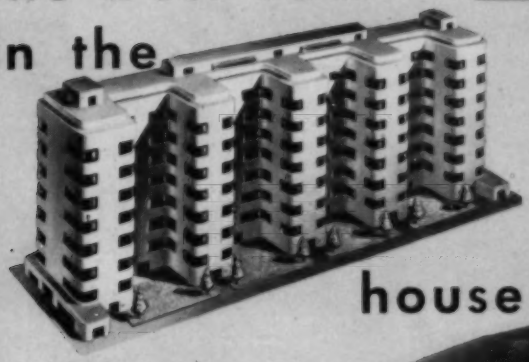
PROTECTS INTERIORS against sun. Keeps out insects. Easily installed. Low in cost. Available from sash and screen manufacturers and building materials jobbers. Write today for free AIA File!

Kaiser Aluminum Shade Screening is produced by Kaiser Aluminum & Chemical Corporation.

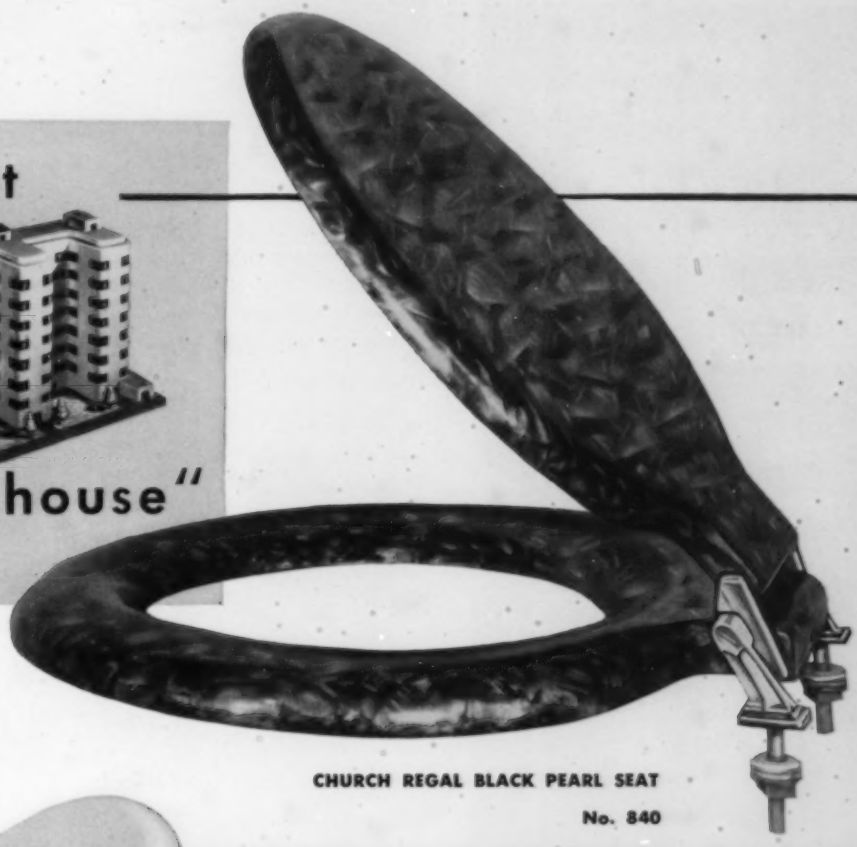
Kaiser Aluminum
SHADE SCREENING

Sold by Kaiser Aluminum & Chemical Sales, Inc.
Kaiser Building, Oakland 12, California

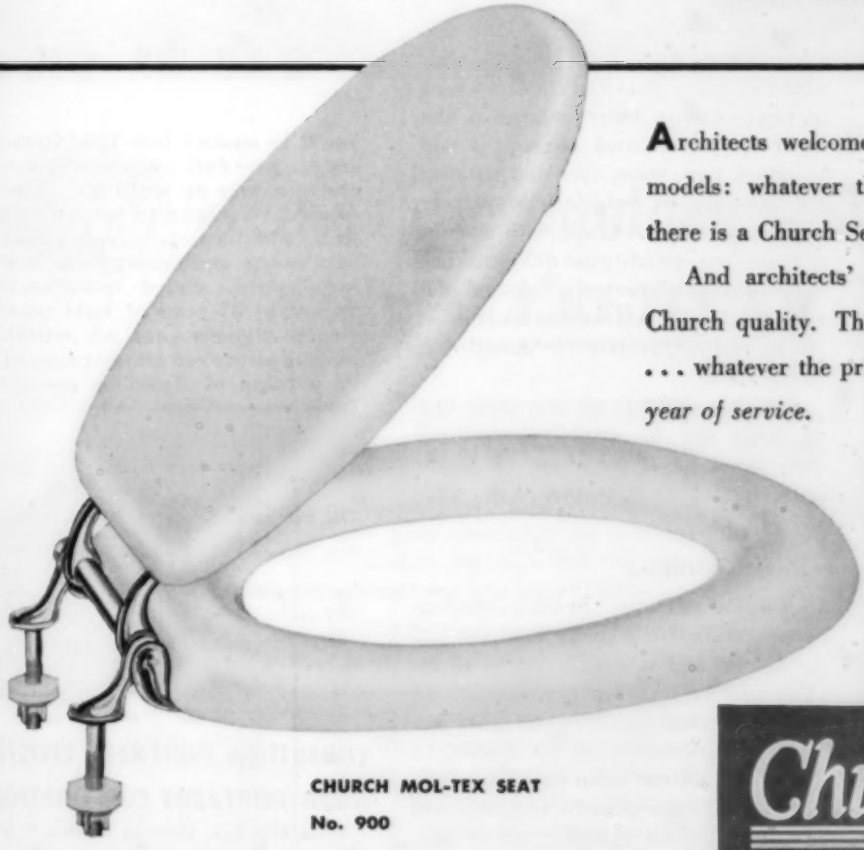
"the best seat in the



house"



CHURCH REGAL BLACK PEARL SEAT
No. 840



CHURCH MOL-TEX SEAT
No. 900

Architects welcome the wide range of Church Seat models: whatever the demands of use or decoration there is a Church Seat to fit the situation.

And architects' clients welcome the assurance of Church quality. They know that whatever the model . . . whatever the price . . . Church Seats *cost less per year of service.*

Church Seats

C. F. CHURCH MFG. CO. HOLYOKE, MASS.
Division of American Radiator & Standard Sanitary Corporation

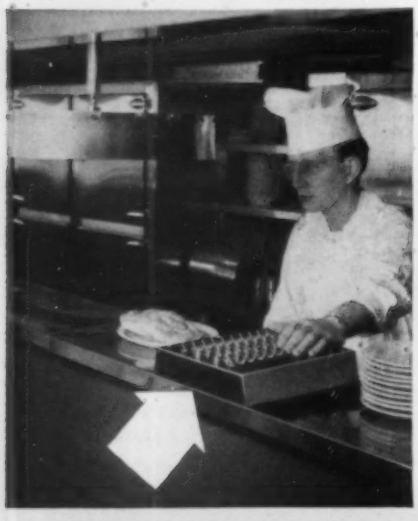
Serving home and industry

AMERICAN-STANDARD · AMERICAN BLOWER · CHURCH SEATS · DETROIT LUBRICATOR · KEWANEE BOILERS · ROSS HEATER · TONAWANDA IRON

CANNON ANNUNCIATORS for CAFES RESTAURANTS

SAVE TIME ↓ AND MONEY

Entrance to Bob's Drive-in Restaurant in Eagle Rock, California, Type M-20 (20 number) with Chime.Cannon Annunciator over door is plainly visible to waitresses to indicate waiting orders.



Arrow points to Type RC-20J Single Pole Toggle Switch Control Unit, with Jewel Bull's-Eye Lights and Chime Ringing Buttons operated by chef as order is ready. Waitress turns off switch as she picks up order, clearing lighted numbers from annunciator.

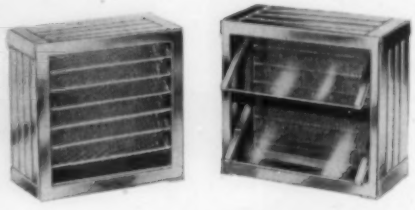
Address Cannon Electric Development Co., Division of Cannon Manufacturing Corporation, 3209 Humboldt St., Los Angeles 31, Calif. Canadian offices and plant: Toronto, Ontario. World Export: Frazar & Hansen, San Francisco.

SINCE 1915
CANNON ELECTRIC

PRODUCTS

(*Continued from page 168*)

64⅜ in. The cover is hinged, and the housing, motor, and fan wheel can be removed without disturbing the rest of the unit. Chicago Blower Corp., 4558 W. Congress St., Chicago, Ill.



Block unit allows controlled ventilation

Ventilator for Glass Block

Weather-Bloc, a ventilating unit the same size as glass block, controls air with two heavy glass louvers which turn on pivots to any desired degree. A fine mesh wire screen inside the unit is said to retard rain, snow, dirt and to keep out insects. The outside is similar in appearance to glass block, with a series of horizontal obscure glass diffusers. The body is of stainless steel reinforced and ribbed to retain and adhere to mortar. No special preparation for installation is necessary.

The glass diffusers are removable and all parts can be cleaned or replaced from the inside of the room. Air Rectifiers, Inc., 3734 Southport Ave., Chicago 13, Ill.

Glass Cylinders

A line of stock sizes in glass cylinders is now available, in diameters from 1¼ to 8¾ in. and in lengths up to 18 in. Mass production is said to enable speedy and economical supply in any quantity. The uses recommended are decorative columns, lighting fixtures, visible hoppers, displays, dispensers, furniture and signs. The stock cylinders are of lime crystal glass with wall thickness of approximately 3/32 in. for diameters up to 4 in. and length to 5 in.; larger sizes will be approximately ⅛ in. or more thick. Ends are finished ground, ground and beveled, or burn-off (beaded edge). Dunbar Glass Corp., Dunbar, W. Va.

(*Continued on page 172*)

Slash Power Costs!!

WITH

TODD BURNERS

-GAS OR OIL

You'll be amazed how Todd Burners cut your fuel and maintenance costs. Savings up to 10% . . . increased power capacity can be yours with Todd Burners. In replacement of obsolete equipment or in new installations, skilled specialists—backed by 35 years of Todd experience—engineer your job individually to assure you utmost economy in burning of liquid or gaseous fuels.

Oil Burners
Gas Burners
Combination Oil and Gas Burners

COMBUSTION EQUIPMENT DIVISION
TODD SHIPYARDS CORPORATION
81-16 45th Ave., Elmhurst, Queens, N. Y.

NEW YORK • BROOKLYN • ROCHESTER
BUFFALO • HOBOKEN • NEWARK • PHILADELPHIA
HARRISBURG • YORK • CHICAGO • CHARLESTON, S. C. • BOSTON • SPRINGFIELD, MASS.
BALTIMORE • WASHINGTON • RICHMOND, VA.
ATLANTA • DETROIT • GRAND RAPIDS • TAMPA
GALVESTON • HOUSTON • MOBILE • NEW ORLEANS • LOS ANGELES • SAN FRANCISCO
SEATTLE • MONTREAL • TORONTO
BARRANQUILLA • BUENOS AIRES • LONDON

Stone and Webster Engineering Co., Boston—Architects and Builders
Allegheny Metal wall panels fabricated by H. H. Robertson Co., Pittsburgh

GE strikes the modern stainless note with ALLEGHENY METAL

For certified data on individual grades of Stainless Steel, use

ALLEGHENY LUDLUM BLUE SHEETS

There is a Blue Sheet for each individual grade of Allegheny Metal, giving full information on its physical and chemical properties and characteristics. Let us send you this certified, laboratory-proved data on the stainless grades in which you are interested.

ADDRESS
DEPT. AR-1

The 4-story, 460-foot long office building that fronts GE's new turbine plant in Schenectady is an architectural first. The walls are 3-inch thick insulated stainless steel panels instead of the usual masonry . . . and no departure from old, time-worn methods was ever better justified.

Beside the obvious advantages of lustrous beauty and lifetime resistance to atmospheric corrosion, the use of stainless walls meant increased floor space, speedier construction, lower erection costs, and big savings in maintenance and depreciation costs. Insulating qualities were superior to a 12″ plastered masonry wall. Weight was so much less that four stories could be placed on structural steel and foundations designed originally for three floors in masonry. Cold-weather construction problems were eliminated, and working conditions were safer and cleaner due to the virtual elimination of material elevators, scaffolding and forms.

Where can *you* use Allegheny Metal to similar advantage? Let our Technical Staff help you.

ALLEGHENY LUDLUM STEEL CORPORATION
Pittsburgh, Pa.

Nation's Leading Producer of Stainless Steels in All Forms

AL

W&D 2764

ALLEGHENY METAL is stocked by all Joseph T. Ryerson & Son, Inc. warehouses

BETTER INDUSTRIAL ELEVATORS

Give your clients the most value, the most advantages by specifying Globe Industrial Elevators for plants and warehouses.

GLOBE ENGINEERED EQUIPMENT

Low initial cost, simplified installation. Low maintenance, oil hydraulic operation. Advanced safety features. Hold-down or automatic push-button control. Rugged construction for heavy loads. No penthouse or load bearing walls required. Countless superior features assure client satisfaction. Mail coupon for specifications and complete details, now.

Estimates or suggestions furnished on any industrial lifting problem by Globe's Lifting Engineers. No obligation.

MAIL COUPON TODAY

GLOBE HOIST COMPANY
1000 E. Mermaid Lane
Philadelphia 18, Pa.

Please send Bulletin A150 showing illustrations, specifications on OilLift Freight Elevators, Sidewalk Elevators, Lifting Platforms and Ramps.

Company.....

Name.....Title.....

Street.....City.....State.....

GLOBE HOIST COMPANY
Des Moines 6, Iowa Philadelphia 18, Pa.

PRODUCTS

(*Continued from page 170*)

Fireproof Ceiling

The problem of providing a lightweight fireproof ceiling to comply with fire codes was solved in the recently constructed Brooks Recreation Center, Raleigh, N. C., by the use of aluminum extruded "T" sections and spun glass block.

The wide steel spans in the 209 by 243 ft building were originally left bare. Building inspectors asked for 2-in. thick concrete ceiling, which was considered prohibitive as to cost and excessive weight on the supporting members. The ceiling finally adopted is said to meet all requirements plus affording an acoustic surface. Dropped from the overhead roof-supporting members, 14-gage wires were inserted in hand punched holes in ⅞ by 2 in. aluminum "T" sections. These "T's" were hung in one direction only, on 24-in. centers and braced laterally by cross rods at 3 ft intervals. Spun glass blocks, 2 by 4 ft and ½ in. thick, were first spray-painted, then laid on the flanges of the suspended "T's" to form the finished ceiling. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

Glazing Compound for Aluminum Sash

The new *D-P No. 1012* aluminum gray glazing compound, made for aluminum sash, is said to stick tightly to the metal. The material reportedly sets up quickly, but remains semi-plastic to withstand movement of the sash. The manufacturers further claim that the compound will not crack, chip or powder; won't creep, sag or pull away; and withstands moisture, heat and cold. The Dicks-Pontius Co., Dayton, Ohio.

Flush Overhead Garage Doors

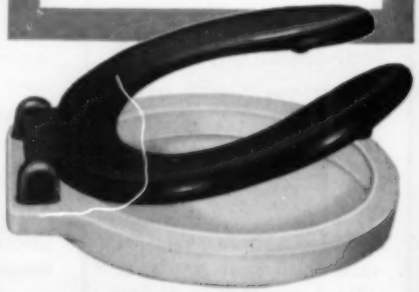
A line of flush, paneled, sectional garage doors has been added to the *Wedge Tight* line. An internal framework of wood is covered on both sides with external grade, waterproof plywood, giving unbroken flush surfaces. Common stock sizes are carried, with others to order by sketch or specification. Any glass or trim arrangement desired can be furnished. The doors are supplied complete with hardware. Calder Mfg. Co., 630 N. Prince St., Lancaster, Penna.

(*Continued on page 174*)

Designed To Stay Cleaner, Last Longer!

MODEL LP-20—Durable *solid* plastic. Open front and back design cuts upkeep to a minimum, gives better sanitation. Self-raising hinge assures cleanliness.

MODEL 50—Durable *solid* plastic. Equipped with self-sustaining hinge which holds seat in whatever position it is raised, eliminating fixture breakage from slamming or kicking.



SPERZEL
123 14th Avenue South
Minneapolis, Minnesota

All Sperzel Seats Fit Standard Bowls

see our CATALOG in SWEET'S FILE

WRITE NOW for details on models illustrated as well as the complete line of quality Sperzel seats. Dept. AR

Reg. U.S. Pat. Off.

MEDUSA
WATERPROOFED GRAY PORTLAND CEMENT

Are You Designing
HAUNTED HOUSES?

We're not talking about designing houses haunted by spirits, but we are talking about those houses that are haunted by the possibilities of water damage for the lifetime of the building! There are thousands of home owners haunted by leaky basements they can't make dry without tremendous expense . . . unnumbered others haunted by wall dampness that makes their homes unhealthy places to live . . . and still others by the unsightly stains marring their otherwise beautiful stucco homes!

Give your clients lasting protection from water damage by specifying Medusa Waterproofed Gray Portland Cement*. . . the cement with actual water-repellent qualities. Medusa Waterproofed Gray affords complete protection against water for all exposed concrete and mortar . . . foundations and basements . . . stucco. Stearates line the pores of concrete and mortar . . . preventing the absorption of moisture.

Hundreds of architects for over 30 years have given their clients peace of mind by designing lastingly dry construction with Medusa Waterproofed Gray. For further information on how to waterproof, mail coupon.

*When not available, use Medusa Waterproofing Powder or Paste.

FIFTY-EIGHT YEARS OF CONCRETE PROGRESS

MEDUSA "JOB-FITTED" CEMENTS

MAIL THIS COUPON NOW!

MEDUSA
PORTLAND CEMENT COMPANY
1015-6 Midland Building • Cleveland 15, Ohio

Gentlemen: Please send me copies of the free booklets, "How to Waterproof Concrete, Stucco, and Masonry" and "A Discussion on Integral Waterproofing."

Name .....

Address .....

City ..... *State* .....